COMMODITY MARKET TERMS

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COMMODITY MARKET TERMS

A DISCUSSION OF WORDS AND PHRASES USED IN THE CONDUCT OF INTERNATIONAL TRADE AND THE METHODS OF DEALING IN PRODUCTS

BEING VOLUME II. OF

TRADE TERM DEFINITIONS

BY

CUTHBERT MAUGHAN

AUTHOR OF "TRADE TERM DEFINITIONS"

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FOREWORD

THE contents of this volume are based on articles which have appeared in *The Times Trade and Engineering Supplement*, and I am indebted to the proprietors of *The Times* for permission to arrange for their republication in book form. I also wish to acknowledge the great help given to me throughout by the editor of that supplement; he had, I believe, many indications that the collection of the information would fulfil a need. The present volume deals with a large number of commodities and follows a series, which has already been published in book form, relating to merchanting, shipping, and marine insurance. That volume met with a very kindly reception from the Press generally, and this fact and evident appreciation of the book by business men have been a great encouragement to me in undertaking the considerable amount of work involved in preparing the matter for publication in the present form.

This little preface must be full of acknowledgments. It will be obvious to all who study the volume that no individual could possibly possess, of his own knowledge, all the information that is contained in it. Many of the commodities discussed have each been the study of a lifetime by those who deal in them, and the value of the book, which I venture to believe is substantial, lies in the fact that the information in it is the outcome of the knowledge and experience of men who, in the true sense of the word, are real experts. The fullest acknowledgment is, therefore, due to all those who have most generously placed their knowledge at my disposal, for without such assistance no portion of the book could have been written.

My experience in collecting the information was, on the whole, extremely pleasant and most interesting. The gathering of the facts demanded much inquiry. First, it was necessary to ascertain, at any rate in regard to some of the smaller industries, who were the undoubted authorities. The next step was to induce them to lend me their aid. Some of them, when the objects of the inquiry were explained, were at once willing to do so. Others hesitated. Some modestly suggested the names of other individuals who, they thought, were better able to help me. In a few cases there was hesitation on the ground that it was not altogether desirable that such information as was sought should be placed at the disposal of the public. There are, of course, in many industries trade secrets which are carefully preserved. Particularly is this true of the manufacturing industries, but the generally accepted view was that as far as the commodities described in the present volume were concerned there was nothing in the methods of dealing which could not be set out in general terms. To such an extent did caution rule that many of my informants stipulated that the sources of the information should, in no event, be disclosed.

Again, some of those who ultimately gave me great help at first suggested that really no particular terms were employed, although even when emphasizing this point they used several words of which I, at any rate, had never heard. The truth was that some of these terms and phrases, although peculiar to particular industries, were so familiar to those engaged in them that they forgot that they were forms of speech unknown to persons outside those trades. In regard to some of the industries the information was gleaned from several members, and so fine were the distinctions drawn on certain points that chapters were written and rewritten two or three times, or more, before the authorities would agree that the facts were quite accurately presented. The collection of the information involved interviews at all sorts of times and in various parts of London, but it is significant of the important place that London holds in international commerce that only in one instance—that of the Lancashire cotton industry—was it necessary to go outside the Metropolis in search of the facts. Many of those who gave me their help have spent years abroad at the sources of the supply of the commodities in question, and knew the industries thoroughly from the practical cultivation of the commodities, or their extraction from the earth, until they were delivered to the manufacturers. Beyond that point the present description does not, as a rule, profess to extend.

The limitations of the information it was intended to gather were, indeed, of much assistance. Sometimes the suggestion was made that it was impracticable within a restricted space to do justice to a particular trade. The answer was that it was not proposed to attempt to give an historical review of the industry, or to describe all its ramifications, but that the main object was to define the distinctive terms in use, so that when business men read market reports of industries of which they had no special knowledge—and it is essential for general merchants and many others, such as bankers and insurance underwriters, to keep in more or less close touch with various industries—they would be able to understand, broadly, what was meant by the technical terms employed. That information it is the precise purpose of this volume to give, though incidentally many who are on the threshold of their business careers can scarcely fail to be impressed by the romance of commerce which is revealed by the brief descriptions that follow.

Finally, while the names of those who, in one way or other, have helped with the collection of the information or the reading of the proofs is legion, there are certain individuals and firms who have taken special trouble, and, since I have authority to do so, I am glad to mention their names. They are those of Mr. E. Belfour, who helped me much with the silk and artificial silk industries; Mr. Percy S. Ehrman, who gave me the benefit of his knowledge of the production and marketing of wine; Mr. J. S. Logan, who assisted me greatly with the chapters on iron and steel; Messrs. W. F. Malcolm and Co., who are closely associated with the flax and hemp industries; and the late Mr. M. J. Weston Clayton, who had made a close study of the wool trade, of which he allowed me most kindly to have the benefit. And I also wish to acknowledge the ready advice on various points bearing on the commodity markets of my old friend and colleague, Mr. G. E. Hanson.

C. M.

LONDON,
September, 1925.

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COMMODITY MARKET TERMS

GRAIN, OTHER FOODSTUFFS, SEEDS, AND VEGETABLE OILS

I.—TYPES OF NORTH AMERICAN WHEAT

Of all the commodities in which international dealings take place, first place must be given to wheat—the staff of life.

By general agreement, there is no finer wheat grown throughout the world than the types produced in the Province of Manitoba, Canada, and in Western Australia. Wheat grown in Canada shares with that cultivated in the United States the distinction of being officially graded under Government inspection before shipment. All wheat exported from North America is certified to be of a certain type and quality, and no disputes can arise in the importing country when grain is delivered, under contracts, bearing this certification. Wheat grown in most other countries is sold on F.A.Q. terms, these conditions meaning that the wheat is of a fair average quality of the season's shipment at time and place of shipment. The standard is based on an average of the shipments made during the period in question. Should wheat, on arrival in Great Britain, prove to be of inferior quality, the buyer is compensated in accordance with the official standard set up by the corn trade associations. In some cases wheat is sold "on sample," as, for instance, Chilean and Russian kinds, and occasionally Argentine wheat. The procedure is for samples to be sealed at the time of purchase and to be opened later for purposes of comparison with the actual grain delivered, should a question of claim arise.

Broad Divisions of Wheat

Wheat may be divided, broadly, into two classes according to whether it is, in appearance, "white" or "red." Actually, the latter is rather of an orange than of a red colour. White wheat is imported chiefly from India, Australia, and the Pacific Coast of North America. Red wheat comes, mostly, from Canada, the United States, Argentina, and Russia. Then, both the white and red descriptions may be either "hard" or "soft," or the wheat may be a mixture of the hard and soft kinds.

The hard quality, the characteristic of which is really described by the adjective, is usually regarded as superior to the soft kind, and so commands a premium. Some descriptions of wheat, such as that known as "Durum" (from the Latin word), which are grown in the United States, and certain kinds of Russian wheat are considered by millers in this country to be too hard, but these kinds of wheat are much liked in Italy, where they are used in the manufacture of macaroni.

What is known as No. 1 Northern Manitoba ranks first among all Canadian types of wheat, and an early place is usually given to quotations of this type in market reports. There are as many as six different qualities of Northern Manitoba wheat, known by the numbers from one to six inclusive. The differences between the quotations of these grades is, as a rule, constant. For instance, taking a "July-August" quotation for No. 1 Northern Manitoba at 50s. per quarter of 480 lb., the corresponding quotation of No. 2 would be about 49s.; that of No. 3, 47s. 6d.; that of No. 4, 45s. 6d.; that of No. 5, 44s.; and that of No. 6, 43s. per quarter respectively. The demand for the lower grades is a limited one. There is also a still lower quality known as "feed wheat," its ostensible use being for the feeding of cattle, for which there is a steadily increasing inquiry.

Such a phrase as "July-August" means that wheat sold on the basis named must be loaded on board the steamer during that period at one of the customary ports of shipment for that particular kind of wheat. As a rule, the prices of wheat for immediate, or early, shipment are higher than those for wheat to be shipped later. Thus, in July, rather lower prices than for July-August may be quoted for "August-September," "September-October," and "October-November."

Periods of Sowing

Wheat grown in the United States is known as either "Winter" or "Spring." The winter wheat is grown in the Southern States, is sown in the Fall, and is reaped in July. The spring wheat is sown in the Northern States in the spring and is harvested in the summer.

Winter wheat is graded in a similar way to the Northern Manitoba kinds of wheat, although dealings generally do not take place in more than three grades. There are similar differentials in the prices, so that taking the quotation of No. 1 Hard Winter wheat at 48s. per quarter of 480 lb., the corresponding quotation of No. 2 would be 47s. 6d.; and that of No. 3 47s., the difference being, in each case, 6d.

Pacific Coast Shipments

A great impetus has been given in recent years, by the opening of the Panama Canal, to the shipment of wheat from the Pacific Coast of North America, and wheat grown in the middle or western areas of North America is, to an increasing extent, being shipped from the Pacific Coast. This important movement has been an outstanding development in the world's grain trade. Excellent white wheat is exported from California, and also from Chile, these types being much in demand in Ireland and the North of England, where bread is baked at home. As a rule, wheat grown in the Western areas of the three Prairie States is of a rather brighter colour that that grown in the East and is much liked by English millers.

At one time the term "Walla-Walla" was well known in this country. It was long applied to certain descriptions of both white and red wheat exported from the Pacific Coast of North America, which were dealt in on the basis of F.A.Q. terms. In 1923 these types were, however, brought within the scope of Government inspection in the United States, and the term No. 2 Western White is now given to what was previously known as White Walla, and No. 2 Western Red is now applied to the description hitherto known as Red Walla. These types of wheat are now sold on the strength of Government certificates of standard quality, which, as already stated, apply to all the types of wheat exported from Canada and the United States.

II.—ARGENTINE, AUSTRALIAN, AND INDIAN WHEAT

TAKING the types of wheat in the order of quantities, consideration should be given to, after North American wheat, that grown in Argentina. The Argentine wheat may be divided, broadly, into the types grown in the northern and southern belts. Wheat grown in the north may be subdivided into kinds grown in the Rosario and/or Santa Fè areas, and known as Rosafè, and in the State of Entre Rios, the latter Spanish words meaning "between the rivers." Rosafè wheat is shipped at Rosario and other up-river ports, and represents by far the larger portion of the nothern wheat. Entre Rios wheat is exported from the lower ports of the River Plate.

All wheat grown in the south of Argentina is known, generally, as "Barletta and/or Russo," and may be shipped from either the ports of Buenos Aires, La Plata, or adjacent ports, or from Bahia Blanca, which is situated on the coast of Argentina below the River Plate. In actual trading the term "Baril" is applied to wheat shipped from Buenos Aires and adjacent ports, and "Barusso" to that exported from Bahia Blanca. Wheat exported from Argentina is, like that produced in North America, mostly shipped in bulk, as distinct from the bags in which wheat grown in certain other countries is exported, and the grain trade from Argentina, which includes oats, maize, and linseed, as well as wheat, represents one of the foundations of the ordinary cargo-vessel freight markets. With all "parcels" or full cargoes of wheat in bulk there is shipped a small proportion of wheat in bags for the purpose of "trimming."

AUSTRALIAN TYPES

Australian wheat is of a white type, and is used for the finest flour. At times it even commands a premium over the first quality of Canadian wheat; although in the 1924-25 season it was, owing to a large crop and shortcomings in other quarters, one of the cheapest varieties. Wheat grown in Australia is divided, broadly, according to the particular State in which it is grown. Generally the best Australian wheat is considered to be grown in Western Australia, but wheat produced in the other States—New South Wales, Victoria, and South Australia—is of very similar quality. All the types of Australian wheat are sold on the F.A.Q. basis. Samples of wheat are drawn from each "arrival" in Great Britain, and from the mixing of these, under the auspices of the corn trade associations, are obtained the standards of "fair average quality" on which dealings are based.

The export of wheat from New South Wales differs signally from the export from the other States, since methods similar to those in force in North America have been adopted there, and wheat is mainly shipped in bulk from elevators. From Victoria, South Australia, and Western Australia shipment is in bags.

Only a small quantity of wheat is exported from New Zealand. It is known as " Tuscan " wheat, and has not the same reputation as the Australian varieties. As in the case of the latter, dealings take place on F.A.Q. terms.

CHOICE WHITE KARACHI WHEAT

Some excellent types of wheat are exported from India. The best descriptions are known as Choice White Bombay and Choice White Delhi, the supply of each of which is comparatively small. The best known type of Indian wheat is Choice White Karachi, which usually commands good prices and represents the greater part of the Indian exportation. There is also a Red Karachi, in which dealings take place in London at a discount, usually, of 1s. per quarter on the price for Choice White Karachi. At one time there was a considerable exportation of wheat from Calcutta, but of recent years the demand for internal consumption appears to have been increasing, so that there is now little for export.

Qualities of wheat grown in India vary, of course, from season to season, according to good or bad weather conditions. Practically everything depends on the supply of moisture provided by the monsoons.

Indian wheat is dealt in on F.A.Q. terms, but the buyer has the additional protection of "analysis terms." This means that he is allowed compensation for any admixture, such as other grain or dirt, which may occur owing to deficiencies in the method of storing, etc.

Some very good qualities of wheat are exported from Chile, and are usually sold on sample. The best qualities are types of hard white wheat, of which Candeao is a well-known description.

Before the war Russian wheat was a highly important factor in the grain markets of the world.

Whether wheat is exported in accordance with certificates of standard quality or is dealt in on F.A.Q. terms, the qualities of the different types necessarily vary from season to season, according to the weather prevailing during the period of growth and harvesting. No other commodity dealt in on a vast scale is liable to greater changes than wheat.

III.—RED, WHITE, AND YELLOW MAIZE

Maize is used largely for the feeding of poultry, for grinding into meal for the feeding of pigs, and, to a small extent, for cattle feeding, and it is also used for distilling purposes. It is grown in various countries. The most important producer is the United States, but, owing to the large internal consumption, the quantity available for export when even a good crop is harvested is quite small, in fact, only about 1 per cent. In the United States maize is known as corn, and is recognized as an article of human diet—particularly in the form of "corncobs." In 1924, owing to the high prices for corn ruling in the United States consequent on a poor crop, fair quantities of Argentine maize were shipped to the United States. Main descriptions of American corn, in which dealings take place in the world's markets when there are any available, are "Mixed American," "Yellow American," and "White American."

Argentine Descriptions

Since so little reliance can be placed on the American crop for export, the most important crop available for the European markets is the Argentine, next to which in importance is that grown in the regions of the Danube. The great bulk of the Argentine maize crop is yellow in appearance, and is known as "Yellow La Plata." It is sold on F.A.Q. terms, subject to the month in which the shipment from South America is to be made, unless it is sold "afloat." Usually every year the earliest shipments of the new Argentine maize crop are made in April-May, and from then onwards until February-March it is understood that all maize sold is of the current crop, and it is so specified in the contracts. Thus quotations given in market reports for July-August, August-September, September-October, October-November, and November-December relate to the current season's crop. In the same way, shipments to be made in December-January, January-February, and February-March will be of the last crop. It is usual to specify in contracts for shipments to be made in March-April whether the shipments are of the old or new crop, and it is assumed that shipments in April-May are of the new crop. If the crop happens to be exceptionally early, a small quantity of the new crop is shipped in March.

In addition to the ordinary yellow maize shipped from South America, there is a description known as "Cinquantino," which may be either red or yellow in appearance. Exports of this description are, however, comparatively small. The bulk of the red Cinquantino is exported from South America to Antwerp. Grain of this description is smaller than the ordinary Plate maize and is used, particularly, for the feeding of pigeons and pheasants. All quotations given in market reports of maize are usually assumed to be the prices per quarter of 480 lb. on the C.I.F. basis.

Often, after South American maize, which, in quantity, overshadows all other types, quotations are given for "Dan.-Gal.-Fox.," the term signifying maize grown in Danubian, Galatian, Foxanian and/or Bulgarian districts. Prices for this type are, as a rule, on about the same basis as those for Plate maize, with the exception that all price offers in the case of "Dan.-Gal.-Fox." are understood to be less 2 per cent., and dealings take place in the same way according, partly, to the month of shipment. Comparatively small quantities of maize are also exported from Bessarabia for which slightly higher prices are paid than for the "Dan.-Gal.-Fox." descriptions, owing to the smaller size of the grain.

White African Maize

In normal years fairly large shipments of maize are made from South and East Africa. A characteristic of South African production is a white type of maize, which is flaked by distillers and yields alcohol. It is also used for the manufacture of corn flour. Besides being of white or red types the maize is described as being either flat or round, the latter descriptions being used, especially, for the feeding of poultry.

Officially, African maize is graded by Government authority into eight types. The first three consist of flat white No. 1; flat white No. 2; and flat white No. 3 respectively. The fourth description is flat yellow; the fifth, round white; the sixth, round yellow, and the seventh, mixed. The eighth division is termed "No Grade," and includes all maize which cannot be classed in a higher grade, but is in a dry condition and fit for shipment. Each of the grades is described in detail. Thus maize to qualify for the term " Flat White No. 1 " must be " sound, dry, plump, and well cleaned, with a maximum of 1 per cent. of yellow, discoloured, and defective grain." There is a large internal consumption of maize in South Africa, and considerable quantities have been exported thence to Australia and the East.

GRADES OF MAIZE MEAL

Substantial quantities of maize are ground in South Africa into maize meal. This product is officially classed into five descriptions, known as white maize flour, granulated white maize meal, ordinary straight milled white maize meal, ordinary straight milled yellow maize meal, and mixed maize meal. The qualifications of these types are also specified by Government authority, so that maize meal in order to be entitled to the description of " White Maize Flour " must be " milled from South African grown white maize, Government standard maize, Grades Nos. 1 and 2," according to the classification referred to in the preceding paragraph.

Maize is grown in India, exports thence to this country being known as either Yellow or Red Karachi, or Calcutta, or Bombay, according to the port of shipment, and it is also exported from Java and Sumatra.

In the past there have been substantial exports from South Russia, the descriptions being known, mainly, as white or yellow Novorossisk. Sometimes there has been a demand for " White Novorossisk " owing to the temporary scarcity of " White African."

Maize is either shipped in bulk or in bags. There is a vast trade from Argentina to the United Kingdom in full cargoes of maize in bulk, with a certain proportion of the grain in bags for purposes of trimming the ship. Dealers in some countries, and notably in the North of France and in Spain, prefer to have the maize in bags, owing to difficulties encountered in some ports in dealing with bulk cargoes.

IV.—MALTING, BREWING, AND FEEDING BARLEY

FROM a scientific point of view, there is no type of grain which is the subject of so much discussion as barley. It is largely used for brewing and distilling, and many experiments have been made with a view to combining in the grain the maximum proportion of the substances which are most valuable in the production of the various kinds of beer and malt foods. In these pages, however, it is the terms commonly applied in the market to commodities and their different forms on which attention is focussed. Business men value highly the experimental work of scientists and agriculturists, but, naturally, as far as daily transactions are concerned, they have to deal with the commodities, and their various descriptions, as they are placed in the market.

In this way dealers know three main types of barley, described as "Malting," "Brewing," and "Feeding" respectively, although in ordinary market transactions the types of barley used for malting, brewing, and distilling are commonly grouped together, broadly, into two classes—namely, "Chevalier" and "Brewing," leaving the types used for the feeding of pigs and cattle in another.

One of the noteworthy features of the production of barley is that, when agricultural conditions are favourable, the home-grown crop goes a considerable way towards meeting the demand for the Chevalier type of barley in Great Britain. This is so called after the Rev. John Chevalier, who first cultivated it. A distinguishing feature of Chevalier barley is that it is narrow-eared with two rows of grain. It is used mainly for malting, including the production of malt extract.

CROPS IN MANY COUNTRIES

Barley is grown in many countries, and is one of the very few products of agriculture which Continental countries have been accustomed to export. Before the war considerable quantities of barley were sent to Great Britain from Germany, Poland, and Denmark, and supplies are still exported thence on a smaller scale. Barley is also exported from the districts of Czechoslovakia. When the crop in Great Britain fails it is rather to California, Chile, and Australia that maltsters and brewers there look largely for supplemental supplies, as all these countries produce a type of barley similar to the English Chevalier. Australia generally exports a considerable proportion of her surplus to the United Kingdom, and also to France, Belgium, Holland, and Germany.

What is known as Australian "Cape" (brewing) barley is chiefly wanted for feeding purposes in Australia and is little exported thence, although it is liked by maltsters in Great Britain.

A principal source of supply of barley for malting is California, which, as already indicated, also exports a certain amount of a Chevalier type. Canada grows considerable quantities of barley which, as in the case of qualities of wheat, are graded under Government inspection. The grain is cultivated mainly in the Western regions. Nos. 1 and 2 are not, as a rule, seen abroad, being, presumably, consumed in Canada. The usual types in which dealings take place in Great Britain are known as No. 3 Canadian Western and No. 4 Canadian Western. The former is used, to a comparatively small extent, for the production of malt extract, but the bulk of it is mainly employed as food for animals. "No. 4 Canadian Western" is regarded as being solely a feeding type, and the same remarks applies to "Canada Feed and/or Rejected Barley."

Similarly, barley grown in the United States is graded by Government authority. The types chiefly known are "48 lb. American Malting" and "46 lb. American Malting"—terms which in Great Britain rather belie their names, since they are really used only for the feeding of animals. The mention of the weight means that 48 lb. weight or 46 lb. respectively are contained in one bushel, and signify light type. Heavier or bolder types of barley weigh from 50 lb. to 52 lb. per bushel, while exceptionally heavy types, especially suitable for distilling, will give even 56 lb. to the bushel.

Good types of barley are grown in the region of the Danube. A recognized description is termed "Dan./Bess./Kust.," the term meaning that the barley is grown in the districts of Danubia, Bessarabia, and Kustendje. Barley from these districts and from South Russia can be used, when the quality is exceptionally good, for malting, brewing, and distilling, but the bulk is employed as food for animals. Before the war large quantities of barley for feeding purposes were exported from South Russia, and were dealt in, largely, under the description of "Azoff/Black Sea," and substantial supplies have since, at times, been forthcoming from South Russia.

Other Descriptions of Barley

Large variations take place in the exportable supplies from India, in good years substantial quantities being available for brewing and malting purposes. For some years the Indian types were, however, used in Great Britain almost exclusively for feeding purposes. During the Great War little Indian barley was obtainable, and brewers had to rely on other sorts, and they were slow to look to India again for supplies. Afterwards, owing to a general short supply of other kinds and consequent rises in prices, they again bought Indian descriptions. Persia is also a considerable producer, but only of barley of a cattle-feeding type. For this purpose the barley is usually regarded as one of the cheapest types available. North Africa exports types of barley known as "Algerian/Tunisian," "Moroccan," "Safi," and "Mogador," for both brewing and feeding purposes.

Barley comes also from Smyrna, and likewise to a small extent from New Zealand—in fact, it is grown in many parts of the world.

Some of the better qualities, of a small round grain, are used for the production of that well-known article of food, pearl barley, and a comparatively small quantity is used for making barley-water.

V.—TYPES OF OATS

The supply of oats grown in Great Britain and Ireland goes a considerable way towards meeting the internal demand, which is smaller than before the war, owing to the great decrease in the number of horses. On the other hand, there has been an increasing demand for oats for use in poultry-feeding mixtures. Oats are described according to their appearance, which may be black, white, grey, mixed, or tawny.

A principal source of supply is Argentina. Oats grown in Argentina are commonly known as "Plate" oats, and are sold on the basis of types F.A.Q., although there is a certain volume of trade transacted on the basis of samples. A considerable business is done in "dressed" or "clipped" oats—terms which mean that the ends have been clipped off by machine.

Canada is another important source of supply of oats. Principal descriptions are termed No. 2 Canadian Western, No. 3 Canadian Western, No. 1 Canadian Feed, and No. 2 Canadian Feed. Canadian descriptions of oats, like those grown in the United States, are sold on Government certificates, although considerable quantities are now again being dealt in on sample. There is also an important trade in rolled oats, which have been both skinned and rolled, and are largely used as a form of porridge.

The United States exports oats to Great Britain of a type suitable for the feeding of horses. A good heavy type of oats is shipped from Chile on sample, and lower grade types are sold on the F.A.Q. basis, while excellent qualities are also brought from New Zealand and California. Exports from the region of the Danube vary greatly according to climatic conditions, and, as in the case of barley, a recognized term is Dan./Bess./Kust. Other noteworthy sources of supply of oats are Sweden, Germany, Algeria, and Tunisia. Comparatively small quantities are at times brought from Australia. Before the war some of the finest thin-skinned oats were exported from St. Petersburg, as it was then known, mainly for the feeding of race-horses, and a number of cargoes of F.A.Q. North Russian oats have since been shipped from Riga and as far north as Murmansk.

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VI.—STANDARD GRADE FLOUR

The British word "Flour," when unqualified, usually signifies the finely reduced endosperm of the wheat berry. There are, however, various other forms of flour, such as rye flour, pea flour, sago flour, and even coconut flour. Flour derived from the treatment of oats is commonly known as oatmeal.

Wheat berries which have been threshed from the wheat plant represent the "Grist" which is brought to the mill. The straw remains as the property of the farmer. The object of the complicated milling process is chiefly to separate the endosperm, or kernel, from the skins which surround it, and to sift, or "bolt," the product resulting from the grinding of the berries. The first of the principal stages is their cleaning, or washing, for, especially in the case of wheat brought from some countries, a good deal of dirt is collected. The wheat berries pass through "break" rolls, which crack them into small particles and separate the skins from the kernel. The particles of kernel then pass through various "reduction" rolls, the function of which is to shatter, or burst, the kernels into flour. In the final dressing process the flour is sifted through silk. Flour of varying quality is produced in the course of the highly intricate milling process, and it is a feature of modern milling that the whole process is automatic, so that from the time that the wheat berries reach the mill until the flour has been poured into the sacks the raw material and the resulting products are never touched by the human hand.

The skins, separated from the kernels, are known as "Bran," which, with other portions of the wheat berry described as "Middlings," represent the "Offals," in which there is a large market, the offals being used for the manufacture of dog biscuits and feeding stuffs for cattle, pigs, and poultry.

BLENDING OF WHEAT

Probably no essential article of food represents such a blending of raw material brought from various parts of the world as flour. The types of wheat employed for milling vary according to the seasons. Generally in Great Britain a small proportion of English-grown wheat is used. Since exports of wheat from Russia ceased to be the important factor they once were, English millers have turned to Argentina and other South American wheat lands, whose exports have largely increased. A representative composition of flour might consist of 25 per cent. of No. 1 Northern Manitoba, 25 per cent. of No. 3 Northern Manitoba, 20 per cent. of Plate, 15 per cent. of Australian, and 15 per cent. of Indian wheat. The use of such proportions of different types of wheat would entitle the resulting flour to be termed "Standard Grade Straight-run Flour."

Before the war the term given to the representative quality of flour sold in the London area was "Town Households." Owing to the exigencies of the war the various grades were temporarily abandoned, and millers were required by the Food Controller to produce only "Straight-run Flour." By the term "Straight-run" is meant that the various qualities of flour are run together.

OFFICIAL PRICE QUOTATIONS

In 1921 grades of flour were reintroduced, but the official price quoted by the London Flour Millers' Association was kept on the basis of a "Standard Grade Straight-run Flour," which may be defined as flour manufactured from the average types of wheat available. Since then official notices have been issued to the Press from time to time stating that the price of standard grade flour has been raised or lowered by so much per sack of 280 lb., and this practice is still followed.

It is the custom of the milling trade to quote prices per sack of 280 lb., although the flour is, as a rule, actually delivered in bags of 140 lb., known as "half-sacks." In some parts of Great Britain the flour is usually delivered in bags containing 144 lb. each. The sacks of 280 lb. have been found unwieldy and difficult to handle, and they are now rarely used.

Another feature of the trade is that, although prices are officially quoted for "Standard Grade Flour," which is a white flour, there is actually no flour in the market bearing that name. The term, as already indicated, signifies flour milled from the average qualities of wheat available at the time, and each miller usually calls his equivalent grade by a distinctive fancy name. Agreement between the milling firms ensures that this standard grade is of a level baking quality, although the names given to it differ. The grades superior or inferior to this standard grade range in number from four or five to as many as eight or nine, each being termed by a special name, the difference in the prices usually varying by about 1s. per sack.

PATENTS, WHITES, AND HOUSEHOLDS

One of the simplest terms used in London districts to describe the standard grade straight-run flour is "Town Straights." The term "Patents" is generally used to indicate flour of the finest quality. The term "Whites" comes next, as signifying flour of a better quality than the standard grade, and the term "Households" is often understood to mean a rather lower grade. There may thus be "No. 1 Households" and "No. 2 Households." Another term indicating a lower grade is "Bakers." A single milling firm will, however, have several different qualities, the prices of which vary relatively according to the official price of standard grade flour.

The term "Town Flour" is applied to flour milled in the London area, and may consist of flour milled from wheat grown either in Great Britain or abroad. "Country flour" is flour milled in country districts and usually from English wheat, and varies in quality according to the circumstances of the locality and season. A small mill in the heart of the country will, naturally, rely largely on local wheat, and its distance from ports may prohibit it from using imported supplies when the home-grown descriptions are not available.

VII.—IMPORTED FLOUR

There are, of course, large imports of flour from the British Dominions and foreign countries which compete with flour milled from imported wheat.

In recent years Canada has, to a large extent, replaced the United States as an exporter of flour milled from the strong, spring varieties of wheat, except of such proportion of the flour as is milled in the United States from Canadian wheat in bond.

The term "patents" which, as already pointed out, signifies the finest qualities of flour milled in Great Britain, is applied also to imports from abroad. Principal descriptions of flour exported from Canada are known as "Canadian top (or short) patents," "Canadian long patents," and "Canadian export patents," or merely "Canadian exports." The top (or short) patents represent the highest grade of imported Canadian flour. A larger percentage of the lower qualities of flour has been extracted from this description than from any other type, and it may be considered to contain a minimum of from 60 to 75 per cent. of the cream of the wheat berry.

Canadian long patents contain a "longer" percentage of the flour contents of the wheat berry, from which the bran has been separated. The percentage ranges from about 80 to 95 per cent.

Canadian export patents are generally understood to be a straight-run flour.

The bulk of the imports to London of flour milled in the United States from spring wheat grown there is of a low grade quality. Recognized descriptions are Minneapolis low grade (best) and Minneapolis low grade (ordinary). There are also imports of flour milled from wheat grown in Kansas and from other descriptions of hard winter qualities of wheat which are graded in much the same way as the Canadian qualities described above. Good qualities of flour are produced from wheat grown on the Pacific Coast of North America and are sold as Pacific hard or soft wheat flour, as the case may be.

Australia exports a straight-run type of flour of quality varying according to the conditions, and Argentina sends low grade descriptions.

A low grade of flour is used as a constituent of paste for bill-posting.

Wholemeal and Brown Bread

The product of the kernel of the wheat berry, which is known as flour, represents the foundation of white bread. There is, however, "Wholemeal," which consists of the kernel and the skins of the wheat berries ground together, and bread baked from the resulting product is known as "Wholemeal Bread." Brown bread is made from the kernel of the wheat berry ground together with the skins, except the outer coarser coverings, and also with the germ. The last-named, which is of an oily nature, is extracted from the berries in the milling process when white flour is produced, as, otherwise, it would discolour the product.

The bran and middlings which are separated from the flour are subdivided into different qualities. A representative type of bran is known as "Broad Bran." Another quality is termed "Ordinary Bran."

A certain quantity of middlings, which represent the medium granular particles of endosperm, is exported from most of the countries in which wheat is milled, but large amounts are required for consumption within the countries of production, either for the manufacture of articles of food for human consumption, or as "Feed" for animals. There is a considerable market in middlings produced in the course of milling wheat in this country, and British millers maintain an export trade in offals.

VIII.—POLISHED RICE

THE rice trade, which is regarded as one of the most aristocratic of the cereal trades, while rice is one of the cheapest of foodstuffs, is concentrated on what may be described as the fringes of Mincing Lane, London.

PADDY AND LOONZAIN

The first term which is met with in the rice trade is "Paddy." This is the rice grain with the husk covering it. In this state—with its overcoat on, as a dealer has described it—the cereal reaches the mills from the plantations. When the husk has been stripped off the cereal is in the form of "Cargo Rice," or "Loonzain." It is now rarely shipped in this form, but cargo rice used to be sent in considerable quantities to German, Dutch, and Southern European millers.

CLEANING AND POLISHING

The next stage through which rice passes is cleaning and shining. This often takes place in the mills in the countries of production, such as Burma. At the same time the rice is usually polished, but only by being rubbed with clean sheepskins. The resulting grain is known as "Cleaned Rice." Nothing is added to the rice in this process to give it a particular polish. That takes place at the polishing mills, which are usually in

Europe. Rice which has passed through this stage—glucose and a very small amount of mineral matter are added to give the grain a high glaze—is known as "Polished Rice," or, in the United States, "Faced Rice." There is probably at least as great a divergence of opinion respecting the desirability of this "polish," as there is about any particular process of production of any commodity.

There are those who maintain that polishing adds nothing to the rice, except its appearance. Housewives, it is said, like the look of it in the shops, and so they are ready to pay the extra cost for this finished article. Incidentally, the cost of polishing the rice is put at about £4 per ton, the chief item of expense being due to the risk of breakage. The glaze, it is generally admitted, is lost in the cooking, so that the consumer gains absolutely nothing by it in food value; in fact, it is contended that the rice loses some of its nutriment in the process of treatment. Only custom, so it is contended by the critics, ordains that the rice should be sold in this polished state, and labour would be saved if people were to become accustomed to buying rice merely cleaned.

Value as a Preservative

On the other hand, it is argued by the supporters of polishing that the treatment preserves the rice and maintains its white appearance. Certainly, unpolished rice loses its whiteness and assumes, with time, a brownish hue. This change of colour is, of course, harmless. A more important contention is that the coating used in the polishing prevents the creation of living matter. In the case of rice which has simply been cleaned, there is often to be seen an accumulation of white powder, which really consists of innumerable eggs of maggots. In the course of time, and if subject to warmth, these eggs may incubate, and the living maggots can be seen, until they become so heavy through feeding on the rice, that they collapse through their own weight. In rice which has not been specially treated weevils are frequently to be observed, which, again, may cause an unpleasant impression among prospective consumers. Yet there are samples of polished rice to be seen in London sale-rooms which have remained unaffected by insect matter for twenty years and more.

Washing before Cooking

The truth about the controversy seems to be that if the consumer could depend on securing fresh, cleaned rice, he would be at least as well off with this form of rice as if he bought the polished variety, but as it is impracticable always to have this guarantee, it is probably as well that the specially treated rice should be available. A contention that the talc used in the polishing, or facing, is undesirable for consumption is countered by the argument that the mineral would be immediately removed by washing the rice, It would, indeed, seem to be a sound rule that polished rice should always be washed before being cooked. It is customary for bags of faced rice from the United States, most of which is known as a type of " Fancy

Blue Rose," to bear an inscription that the rice should be washed before use, and the practice is now being developed in the case of other descriptions of polished rice.

"SINGLES" AND "DOUBLES"

Rice is now produced in many countries, notably in Burma, Siam, Cochin-China (the three chief exporting countries), and the United States, Java, Spain, Italy, Japan, China, Brazil, Bengal, and East Africa. The different descriptions are usually known chiefly by the names of the countries of origin. It is common for quotations in market reports to be given for "Singles" and "Doubles." The term singles means that the rice is packed in single bags, and doubles that, in addition, an inner bag is used.

IX.—LINSEED, RAPESEED, AND COTTON-SEED

BUSINESS takes place on a fairly large scale in three types of seed from which oil is extracted—namely, linseed, rapeseed, and cottonseed.

The largest linseed crop is grown in Argentina and is dealt in on the London Market on the basis of F.A.Q. contracts. Linseed is also exported from India, the principal ports of shipment being Calcutta and Bombay. Thus well known descriptions are termed "Bold Bombay" and "Calcutta."

Linseed is always exported in bags. The bags of Indian linseed contain about 200 lb. and the Argentine bags rather less. The prices which are quoted per ton vary according to the period of shipment. Thus higher prices might be quoted for March-April shipment than for April-May and May-June. Linseed is also sold "On Passage." In the past it was largely exported from Russia. Linseed cake is used as a feed for cattle. As stated in the succeeding chapter, the oil extracted from it is employed in the manufacture of paint and linoleum, and it is also used for the production of soft soap—mainly on the Continent.

Most of the rapeseed dealt in on the world's markets is grown in India and shipped in the same way as linseed. There are a number of qualities known by the districts where they are grown. Thus there are Brown Cawnpore, Yellow Guzerat, Ferozepore, Jamba, and Toria. Rapeseed is also grown in a fairly large way in Germany, but the German crop is mainly consumed internally.

Cottonseed is exported largely from India and Egypt, and also, to a smaller degree, from East Africa, Brazil, Argentina, and Smyrna. Bombay cottonseed is sold on the F.A.Q. basis per ton in a similar way to linseed and rapeseed. Principal types of Egyptian cottonseed are "Egyptian Black" and "Sakellaridis." The large production of cottonseed in the United States is crushed in that country. Uses of the oil which is extracted from it are mentioned in the following chapter.

X.—VEGETABLE AND ANIMAL OILS AND FATS

HIGHLY important trades which seem to be steadily increasing in volume are those in oils. These commodities may be split into three main divisions—namely, vegetable, animal, and mineral. The animal and vegetable oils are dealt in, as a rule, by the same firms, London being one of the principal markets in the world for the products. The mineral oil industry is in a class by itself, and is discussed in Chapter XXXV.

Of late years animal fats and oils, which, for trade purposes, are classed together, have, to a large extent, been replaced by vegetable oils. The most common illustration, perhaps, of this tendency has been the substitution as a food of margarine for butter.

Before the war this country was mainly dependent for supplies of margarine on the Continent, and notably Holland. Necessity became the mother of a large industry in this country concerned with the manufacture of margarine. Whereas, before the war, the production in this country of margarine was only sufficient for half its requirements, it now considerably exceeds consumption.

Vegetable oils may be defined as the products of various seeds, nuts, fruits, and kernels. The one which is best known in household use is olive oil, which is pressed out of olives, and is largely used in this country as salad oil. It is produced in Spain, Italy, and other Mediterranean countries.

Oils for Soap-making

Vegetable oils are sold as either crude or refined, all vegetable oils, except olive oil, needing to be refined before they can be utilized for edible purposes. A number of crude oils are used for soap-making. The acid oils, the residue of a refining process, are also used for soap-making.

Of the vegetable oils which are not used for edible purposes, the most important is probably linseed oil. This, unlike olive oil, which is exported from the producing countries in liquid form, is mainly obtained from linseed in the crushing mills of Europe. The principal uses of linseed oil are in the manufacture of linoleum, soft soap, and paint and varnish.

Raw linseed oil is used for linoleum and soap-making, but for the production of paint and varnish it needs to be boiled or refined.

Cottonseed Oil

Cottonseed oil, or cotton oil, as it is commonly termed in the trade, is also of much importance. It comes, naturally, from the great cotton growing countries of the world—the United States, Egypt, and India. It is used for the manufacture of margarine and soap, and the frying of fish.

The Crushing of Seeds

Other vegetable oils which are largely dealt in include groundnut oil, rapeseed oil, soya bean oil, coconut oil, palm kernel oil, and palm oil.

Groundnut oil may be described as the oil obtained, by a process of crushing or extraction, from groundnuts, which are produced in North America, China, India, and Africa. The oil, when refined and deodorized, is used as salad oil. Soya bean oil is produced in the Far East, but it is also crushed in Europe from soya beans shipped to Europe from Manchuria. After the oil has been extracted, what is known as soya cake is left and is used for cattle food.

The oil from rapeseed, which comes mainly from India, is used, after being deodorized, for the manufacture of margarine. It is also employed in the refined state for lubricating and burning purposes. The principal producing centres for coconut oil outside Europe are Manila, Ceylon, and Cochin. Most of the Manila oil is shipped to the United States, and the Cochin production is chiefly consumed in India. Considerable quantities of copra are shipped to Europe and are crushed by European mills. The oil crushed in Europe is usually known as copra oil, while oil which is shipped to Europe from India is generally described as coconut oil.

Palm kernel oil is obtained, by crushing or extraction, from palm kernels imported from the West Coast of Africa. Before the war the chief palm kernel crushing industry was in Hamburg, and practically all the palm kernel oil consumed in this country was imported from Germany. On the outbreak of war necessity again became the mother of a big industry, and the crushing plant in this country is now well in excess of the actual requirements for consumption in the United Kingdom, and considerable quantities of palm kernel oil are shipped from this country to Germany. Palm kernel oil is used in the crude state for soap-making, and in the refined state for the manufacture of margarine. Palm oil is shipped from the West Coast of Africa. It is a solid oil of orange or red colour, and is used for soap- and candle-making. The greater portion of the West African production is shipped to Liverpool. It is also refined and deodorized and used for edible purposes.

Principal Animal Fats

By far the most important of the animal oils and fat is lard, which is obtained from the hog. Considerable quantities are imported from North America, and wholesale transactions take place on a large scale. Tallow is also an animal fat of great importance, which is used chiefly in the production of soap and, as the name suggests, in the manufacture of candles. The finest beef and mutton fat obtained from the animals is the kidney fat, which is shipped from Argentina and Australasia as Premier Jus, and is used in the manufacture of margarine, shredded suet, and compound lard for confectionery purposes. In North America, and also to a small extent, in South America, part of the Premier Jus is pressed, and yields Oleo oil and Oleo Stearine, Oleo oil being the raw material from which the finest animal margarine is made. Included, for trade purposes, among the animal fats and oils are fish oil and whale oil, and blubber.

XI.—SUGAR CUBES AND CRYSTALS

The London sugar market, which is centred in Mincing Lane, may be divided into five sections. First, there are the importing merchants who bring to the United Kingdom the sugar of the British Dominions and the Colonies; secondly, there are the brokers who act as a medium between foreign exporters and British dealers, and also between importing merchants and refiners; thirdly, there are the refiners who rely for their industry on the raw products of the West Indies, Cuba, Java, Natal, Mauritius, and Brazil; fourthly, there are the dealers who buy from the brokers and the refiners and sell to the trade and the manufacturers who represent the fifth section. Before the war beet sugar was largely imported from the Continent; now a little beet comes from Poland.

Sometimes precedence is given in reports of the sugar market to the prices for the refined standardized products of the British and foreign refiners, and they relate mainly to granulated sugar.

Origin of Loaf Sugar

"Cubes" represent refined sugar in cubic lumps. Sugar of this kind is sometimes known as lump sugar, and sometimes as loaf. The last name is a relic of the days when refined sugar was generally made in conical loaves, which were also known as "titlers." The cone-shaped loaves were bought by grocers, who chopped them into small and very irregular pieces, suitable for household use. This was a slow and laborious process, and it was due to the enterprise of the late Sir Henry Tate that machinery was installed in this country for manufacturing the sugar in its present cubic form. The sugar is originally produced in slabs, or plates, which are placed between two rows of knives and travel about three-quarters of an inch at each movement, so that the slabs are cut diagonally in two directions, each cutting forming many cubes. The saving of time and labour to the grocer through this manufacturing process is so great that it has led to the displacement of the old-fashioned sugar loaf.

Another variety of cube sugar is known as "A.T. cubes," the "A.T." representing "Afternoon Tea." The cubes of this size are rather smaller than the ordinary cubes and are specially designed for little teacups. The standard form of cubes is known as "No. 1."

Chips, Caster, and Nibs

In cutting the sugar slabs into cubes a certain quantity of small and irregular pieces are produced. These are sold under the names of "Crushed Sugar" and "Chips." They are largely used for manufacturing purposes and domestic jam boiling and cooking.

"Crystals" are a description of refined sugar and take the form of well-defined crystals in various sizes. "Granulated Sugar" is the type which is now in most general use, and is in the form of crystals which are smaller than those of "Crystal Sugar." They are dried in a large vessel called a sugar granulator, which imparts a sandy, granular character to the product. Granulated sugar is usually sold under the names of stoved, fine, coarse, No. 2, superfine, and standard, the difference being mainly in the size of the small crystals.

Caster sugar is made in several sizes. It is a small, sandy sugar used to sift or "cast" over tarts or puddings, and is usually applied through a vessel called a caster. "Nibs" are a description of sugar generally used on the top of bath buns. They usually consist of clusters of small crystals. "Coffee Crystals" are large white crystals used in coffee after meals. Some people prefer them to Demerara crystals. "Icing" sugar is sugar reduced to an almost impalpable powder. It is soft and has no grain, and is used for coating wedding cakes, etc.

PIECES AND MINERAL WATER SUGAR

"Pieces" is the name given to the lower grades of refined sugar. These vary in appearance from white to brown, and are generally of a soft grain, with varying proportions of a natural syrup of the cane adhering to it. Not being pure white sugar, Pieces are retailed at a lower price, and are also used in manufacturing processes.

Mineral water sugar is especially made for the manufacture of sweet mineral waters, such as lemonade and ginger-beer. It has to be pure and free from any added colouring matter. "Pulverized" is a sugar somewhat between "Caster" and "Icing." It is used for much the same purposes and for the manufacture of certain summer beverages.

Yellow Crystals

Yellow crystals are crystallized sugar made from the cane in the West Indies, and are not refined. They are much appreciated by connoisseurs, who justly claim that this is the only kind of sugar that contains the flavour and the chemical properties of the sun-grown cane. Yellow crystals are of a pleasing golden appearance, and possess a distinct flavour of honey, which is derived from the aromatic substances in the original cane juice. Refiners also make "Yellow Crystals," which, however, are a form of refined sugar coloured with refined syrup, and have much the same appearance as the West Indian yellow crystals.

Products of Sugar Refineries

"Golden Syrup" may be defined as a form of sugar and the product of the sugar refineries. It is sold in different grades varying from pale yellow to dark brown, and it is used like jam or butter on bread and for various culinary processes.

Molasses and Rum

The lowest product of a sugar refinery is called molasses, or treacle. This is much darker in appearance than golden syrup, and is used chiefly for mixing in cattle food, although it was, on the testimony of Dickens, supplied to the boys, including Nicholas

Nickleby, at Dotheboys Hall. It is also used for distilling into alcohol at the distilleries. The alcohol thus produced is sold mainly as methylated spirits.

Molasses are also the last product of the raw sugar factories in the Colonies, and are sold for the purposes just mentioned. A certain amount of the product is distilled in the Colonies into rum, some of which, and particularly that produced in Jamaica, is famous. Under the term of "Grog" it has long been consumed in the Navy, and it was largely supplied to the Navy and Army in the Great War. Further reference to rum is made in Chapter LXXV.

XII.—COMMON TEA

The term " Common Tea " is frequently used in the tea trade, and it often appears in market reports, precedence being, as a rule, given to the prices for that description.

The term " Common " as applied to tea has a general and elastic meaning. Tea is graded into several classes which are well recognized in the trade, but all of these grades may yield their proportion of common tea. Again, districts which are famed for the quality of their tea will contribute their quota of common tea and, likewise, gardens of high repute. Then, tea which, in a season yielding a high proportion of fine tea, is classed as " Common " may, in another season, when the general standard is not so good, be placed in a higher grade.

Broadly, tea is valued according to (1) appearance and size of the leaf, (2) flavour, and (3) colour. In ordinary years common tea is distinguished by no attractive attributes. Something—indeed much—will depend on the plucking. What is known as " coarse plucking " gives a poor-looking leaf and poor " liquoring " tea or, in a trade phrase, a " poor cup." After the tea has been plucked there are the processes of manufacture—namely, withering, rolling, fermenting, firing, and sorting, and faulty manufacture in any of these stages will affect the quality of the tea. " Firing " is equivalent to cooking, and sometimes tea is spoilt by being burnt in the same way that, in ordinary household cooking, food may be ruined by being burnt.

Description of Plain Tea

Common tea may be defined as that which gives the plainest and lightest "liquor," is thin, and has no particular flavour. It is right to explain, however, that there are times when the term "common tea" is avoided. Growers have their sensibilities, and brokers will hesitate to tell them that their tea is "common." The adjectives "plain," or "plainer," are pleasanter terms, and there is justification for using them, since there are such terms as "flavouring," which distinguish descriptions of tea that, as a rule, are not plain or common. But while plain is often a suitable word, there is no escaping the fact that common tea has its well-recognized and old-established place in market phraseology.

Indian tea may be graded, broadly, as Broken Orange Pekoe, Broken Pekoe, Orange Pekoe, Pekoe, Broken Pekoe Souchong, Fannings, and Dust.

There are various other minor gradings, such as Flowery Orange Pekoe and Pekoe Souchong, but the seven grades named represent a fair grouping of Indian tea. Any of the grades may produce their share of common tea. A market report once showed that "fine and finest Broken Pekoe and Broken Orange Pekoe realized from 1s. 9d. to 7s. 2d. per lb." Imagination may be left to ponder over the possible prices at which tea bought at 7s. a pound wholesale would be sold in the retail shops. Probably much of the most costly tea would be used for blending.

PEKOE AND SOUCHONG

The term "broken" means that the leaves have been broken by rolling or by being passed through a cutter. Most of the Orange Pekoe and Pekoe grades are leafy and "unbroken," and find their way to export markets, notably Canada and the United States, which especially like these sorts. The terms "Pekoe" and "Souchong" evidently have a Chinese origin. Similar names are given to tea grown in Ceylon and Java. Other sources of supply are Sumatra, China, Japan, and now South Africa, and all these countries yield their quota of common tea.

"Fannings" represent tea which is generally not so "sizeable" as a Broken Pekoe, but, as a rule, is more leafy than dust and usually gives a strong liquor. The term "Dust" really explains itself. It is the lowest form of tea in which the market deals.

TIPPY TYPES OF TEA

Tea is frequently described in the market as "tippy." This means that the tea is rich in golden, or yellow, ends. The tips are, in fact, the unopened buds. As a rule, the larger the sprinkling of these the more valuable the tea. The orange appearance of the tips is indicated in two of the names set out above, and some tea is sold retail as "Golden Tips."

Before tea is submitted at auction it is usually inspected and is tasted by experts, known as "tasters," who will advise the growers as to the limit of price that, having regard to current market conditions, should be placed upon it, and the grower, or his representative in London, will then agree with the broker on the limit. As a rule, the broker is left with a fairly free hand in the disposal of the tea. Tea is sold in auction at prices per pound, and at advances of ¼d. per pound. In normal times a tea auction, like sales of other commodities, is a very noisy affair, yet good feeling usually prevails among all concerned. The tea is submitted in "lots" of so many cases, an average being forty chests or packages. A chest of Indian tea contains from 110 lb. to 120 lb., and in the course of one hour from 240 to 400 lots may be disposed of, the maximum amount representing sales of nearly seven lots a minute. Tea representing a great many thousands of pounds sterling may easily pass under the auctioneer's hammer in the course of an hour.

XIII.—TYPES OF COFFEE

London is only one of several important world coffee markets, for the United Kingdom is not a coffee-drinking country to the same extent as some Continental nations, and notably France and Germany. Havre, Antwerp, and Rotterdam are great European coffee markets, and likewise New York on the other side of the Atlantic.

Arbitrations in London

Yet, though London, as a coffee market, shares its place with other centres, its knowledge of the marketing of coffee is universally admitted to be second to none. Dealings in Brazilian coffee chiefly take place on the basis of "types," such as "extra prime," "prime," "superior," "good," etc. The contracts provide that should the actual supplies not reach, in the estimation of the buyer, the standard of the particular type provided for, there shall be arbitration, and frequently there is a stipulation for arbitration in London, although no part of the original transaction may have taken place there. The coffee may have been bought by firms in Central Europe from Scandinavian houses for shipment from South America, but in the event of a dispute as to quality London arbitrators may be asked to act. There is a panel of experts who are willing to arbitrate, and each may act many times in the course of a week. Naturally, their reputation for knowledge, sound judgment, and absolute impartiality is highly prized.

Sources of Supply

To a large extent the commercial value of the coffee beans, which are the seeds of the coffee flower, depends upon their form, size, and colour. As was explained in the preceding chapter on the grading of tea, flavour is one of the principal factors in the valuation of tea. The tasting of coffee on similar lines to the tasting of tea is not necessarily part of the duties of the coffee brokers. Samples of the coffee beans to be offered at the auctions, which are held two or three times a week throughout the year, are available in the sale-rooms for examination by possible buyers, who, if they choose, will take away portions and have them ground, roasted, and the coffee made in the usual way for tasting.

The various descriptions of coffee are classed, in the first place, according to the country of origin, and the quantities which come from the different countries vary according to the time of the year. About three-fourths of the supplies are produced in Brazil. Other supplies come from countries in Central America, the East and West Indies, East and West Africa, and Turkey and Abyssinia. Coffee produced in the last two countries named is known as mocha.

THE GRADING OF BEANS

The beans from all the countries are passed through pattern sieves. They encounter, first, small meshes, then medium-sized meshes, and, finally, large meshes. The result is that the beans are classed, as a rule, into large, or bold, medium, and small grades, and are sold under such terms. Each flower contains two seeds embodied in a yellowish pulp, which are included in a parchment surrounded by a husk, known as the "cherry," all of which are removed in the country of production. The two seeds are laid in the parchment against each other so that the beans have on one side a flat surface. Size counts for much, on the assumption that the larger beans are fully developed and contain the largest proportion of caffeine.

Peaberry is the name given to the bean when only one seed is developed in the fruit. The bean is not flattened on one side, but is circular in appearance. It is small, like a pea. The prices of peaberries are specially quoted in reports of the coffee market.

COLOUR AS A FACTOR

Colour, together with size, is considered. So there are such terms as "good bold coloury," for which some of the highest prices are paid. Other descriptions are "bold coloury," and then "bold greenish," "bold greyish," "bold grey-greenish," "bluish grey," and "greyish," according to appearance. Most of the coffee beans from countries other than Brazil are

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washed before shipment and so tend to be brighter in appearance than Brazilian coffee, the bulk of which is shipped in an unwashed state.

THE "FUTURES" MARKET

There is a considerable market in "futures" in New York, but the futures market in London has dwindled since the disturbance caused by developments due to the Great War. Speculative dealings take place for delivery over periods extending for many months and frequently have little relation to actual prices. The New York basis of dealings is Type No. 7, Rio, in terms of dollars and cents per 100 lb., with facilities for delivering other kinds at varying allowances. The London basis for such dealings is Superior Santos, with facilities for tendering coffee at 3s. below and 3s. above the basis price per cwt.

XIV.—FAIR FERMENTED COCOA

Cocoa, or cacao (the old Spanish name for the product), is grown in British lands to a much larger extent than coffee. The consumption, *per capita*, is also much greater, but that consumption takes into account the various forms of chocolate, of which the cocoa bean is a constituent. The chief source of supply of cocoa is the West Coast of Africa.

Primarily, the cocoa beans are distinguished in the market by the name of the country in which they are produced or the chief port there, and then they are graded roughly into qualities, such as "common," "fair," "fine," and "superior." In recent years there has been an attempt to standardize the quality of cocoa from the Gold Coast. The term "Fair fermented Accra" cocoa may be defined as being the product of the Gold Coast which is defective by not more than 12 per cent. and contains not more than 10 per cent. of slaty matter. By "defective" is meant that the kernel of the bean is "mouldy" inside.

Good fermented Accra is a similar product which is defective by not more than 5 per cent. and contains not more than 5 per cent. of the slaty beans. While grading in this way may be useful, the expert, as a rule, prefers to rely in estimating qualities on his own senses of sight and smell.

THE PROCESS OF FERMENTATION

On being cut open, a well-fermented bean should break freely and show a rich brown colour. Violet, slaty, cheesy beans are a sign of insufficient fermentation. The latter process, it may be explained, takes place in the country of production. The pods containing the seeds are broken open and the seeds, which are covered with mucilage, are either placed in sweating boxes or are heaped and covered with leaves or other material. The process of fermentation lasts, as a rule, for several days. One result of fermentation is that the beans lose part of their bitter flavour and develop an essential oil. Most of the cocoa brought to this country has previously been fermented. Some forms of cocoa, notably ordinary Jamaica, Lagos, and Haiti descriptions, are only poorly fermented, yet, since they are cheaper, there is a good demand for them.

After fermentation the beans are dried either by being spread on the ground or on special floors and there exposed to the sun, or otherwise in artificial driers. Insufficiently dried cocoa is liable to lose weight and to become infested with weevil if kept for long.

After the cocoa bean has been cut open the expert will rub the substance in his hands and, the warmth having brought out the flavour, he will then be able to judge whether the bean is over-cured, "hammy," smoky, sweet, strong, or mild in flavour. The final test by the prospective buyer may be that of roasting.

In the course of manufacture the bean is roasted, the process having the effect of developing the aroma and loosening the shell, or husk. This covering is then blown off in a winnower and the germs are separated by means of a small sieve. The resultant product is the cocoa nib, which is ground into a mass. A certain quantity of the fat, known as cocoa butter (a recognized article of commerce), is pressed out, and the residue, after being broken up and passed through sieves, is available as cocoa powder for mixing with water for drinking purposes.

Definition of Chocolate

Chocolate may be described as a mixture of cocoa mass and sugar, to which is added, as a rule, cocoa butter and flavouring matter, such as vanilla. It is formed into a thick, soft mass, which, after being dried, is sold in various shapes and forms. Milk chocolate may be defined as a mixture, mainly, of milk, sugar, and cocoa mass. The amount of cocoa in the makes varies. In some brands the percentage of cocoa is very small indeed. For the manufacture of the finest chocolate, cocoa imports from Central and South America, Ceylon, and Java are usually preferred, owing to their delicate flavours.

Besides "Fair Fermented Accra," recognized terms of cocoa include "Common to Fine Grenada," often described as the "Consols" of the cocoa market, "Middling Red," "Mixed Estates," "Superior Trinidad," "Fair and Superior Bahia," Para Sertao, F.A.Q. Sanchez, fine St. Thomé, San Felipe, and fair clayed and unclayed Caracas (produced in Venezuela), and fine Java. " Arriba " is a type of cocoa grown on the Highlands of Ecuador. Types grown on lower ground are known as Balao and Machala (geographical names). The term " Ceylon Ordinary " covers a number of indifferent qualities. " Good Plantation Ceylon " represents one of the best products of the island.

TERMS OF SALE

Before the Great War it was customary to hold auctions of cocoa regularly in London, which is one of the chief markets. Other important markets are Liverpool, New York, Havre, and Hamburg. The bulk of the business is now done by private treaty, samples being available for examination at the various salerooms. Dealings usually take place on the basis of one of four terms. When cocoa is bought L.L.T. (London Landed Terms) the commodity is in bonded warehouse or at the docks, from which the buyer will have it fetched. "L.Q.T." (Liverpool Quay Terms) signifies that the buyer will take delivery at the dock or quay in Liverpool. The other bases are "C.I.F." and "F.O.B.," a peculiarity of the latter being that, contrary to the general rule in the case of most commodities dealt in on F.O.B. terms, it is for the seller of cocoa F.O.B. on the West African Coast to provide freight to the destinations for account of the buyer, who pays for it.

XV.—SPICES FROM THE EAST

The romance of commerce seems to be epitomized in no way more effectively than in the trade in spices. The Old Testament contains many allusions to them, and poets, among them Shakespeare, have sung their praises. Instinctively the word "Spice" seems to conjure up the odours of the East, and such terms as fragrant, pungent, piquant, and aromatic. They whet the appetite, and their virtues were well indicated by Cowper in "The Task" when he wrote:—

> Variety's the very spice of life
> That gives it all its flavour.

The fact that a little tincture goes a long way has resulted in the word "spice" being used to mean, incidentally, a minute quantity of anything.

The housewife may buy from the grocer an ounce of cloves, yet, in the wholesale trade, large quantities are bought and sold. Otherwise, brokers who live on a small commission would always be poor men. Cloves are dealt in, as a rule, on the basis of so many bales or boxes, each of which contains many pounds. Similarly, the housewife may buy from the grocer two or three nutmegs for a penny. Nutmegs are bought and sold wholesale in bags or boxes, and from, perhaps, 100 to 1,000 boxes may be dealt in at a time.

Chief Sources of Supply

From the earliest days spices have been associated with the East. They are still shipped, to a large extent, from the Straits Settlements, Java, India, and to some extent from China and Japan. Some of them are, however, produced in other parts, and notably on the East and West Coasts of Africa and in the West Indies. London is the chief market of the world for spices. The great majority of the transactions in these comparatively rare commodities take place in Mincing Lane, and in the buildings in the courts and alleys which surround it. These offices, where the samples of the different spices are displayed for inspection, are often the scenes of very active business.

Descriptions of Pepper

The spice which will be most familiar to the reader is pepper, for it is usually to be found on every table, at every meal. It is the only spice in such common use. It may be defined as the dried berry of the pepper-vine. The berry grows in clusters in the East and, like other spices, it is ground before use.

All true pepper in its original state is black. White pepper is that which has had the skin rubbed off. Sometimes this is done, although not always perfectly, by the natives. Black pepper is also treated largely by machinery in Great Britain, the resulting white product being of clean appearance. Two main descriptions of pepper are produced in India, known respectively as Tellicherry and Aleppy, of which Tellicherry is regarded as the superior. Pepper is brought from India in strong gunny bags, each containing about 1¼ cwt., and the commodity may be dealt in on the basis of parcels of from about 5 to 50 tons at a time, while the price quoted will be at the rate of so much per pound.

Pepper is also produced in the islands of the East Indies and the Straits Settlements. One of the best-known descriptions is "Black Singapore," which signifies a black pepper shipped from the East. Other well-known terms are Black Lampong and White Muntok. The latter is grown in the Island of Banka, off Sumatra, and has had the skin rubbed off before shipment. A little pepper also comes from Ceylon.

Capsicums and Chillies

Capsicums, representing a dried pod of the capsicum plant containing seeds, are grown in India and certain parts of Africa, notably Nyasaland. They are used largely for the manufacture of what is known as red, or cayenne, pepper.

Chillies may be defined as the dried pod of a plant of the capsicum genus. They are produced largely in East Africa and are dealt in on the basis of bales containing from 100 lb. to 140 lb. each. Their main characteristic is their extremely hot flavour, and they are used in the manufacture of chilli vinegar. They are also distilled for the oil.

Cloves from Zanzibar

The chief source of supply of cloves is Zanzibar. The export from the island amounts, on the average, to some 200,000 bales of 132 lb. each per annum, and to about 95 per cent. of the world's supplies. Cloves are also grown in the neighbouring island of Pemba, and are taken to Zanzibar, where they pay tribute to the Sultan, for exportation to the markets of the world. The commodity represents the flowering bud of a bush. A very fine type of cloves is grown and exported from Penang. It is regarded as a fancy article, for which much higher prices are paid. Comparatively small shipments of cloves are made from Java.

Nutmegs and Mace

Nutmegs are produced in Java, the West Indies, and the Straits Settlements. They are the kernel of the fruit of the nutmeg-tree around which, as a covering, mace, also used in cooking, grows. Nutmegs are exported from Java in one-picul boxes—a picul being about 133 lb.; from the West Indies they are shipped in bags containing from 1½ cwt. to 1¾ cwt.; and from Singapore they are exported in half-picul boxes containing about 66 lb.

XVI.—GINGER AND CINNAMON

Ginger may be described as the product of the root-stock of a tropical plant, which grows in West Africa, India, Japan, and Jamaica. It is dried before shipment. The ginger varies in appearance, from the lightest pale yellow to dark brown. The lightest sort and one having the best flavour, with no suspicion of an unduly pungent "bite" about it, is grown in Jamaica.

Cochin and Calicut Ginger

Indian descriptions of ginger are divided, mainly, into two sorts grown in Cochin and Calicut, on the Malabar Coast, respectively. Sometimes Calicut ginger is scraped and trimmed before it is exported—processes which give it an extremely neat appearance that appeals to many cooks. Cochin ginger, although washed and dried and sometimes bleached, does not have the rough corners cut. The darker and strongest flavoured description of ginger is that grown in West Africa. The different descriptions are bought by manufacturers with a view to the particular purposes they have in mind, as, for example, the manufacture of ginger biscuits or ginger-beer. Ginger for use in powdered form and in cooking for flavouring purposes is, of course, distinct from preserved ginger sold in jars and exported from China.

Types of Cinnamon

Cinnamon is the product of a plant which grows largely in Ceylon. There is also a type of cinnamon produced in Java. The product is shipped in bales containing the commodity in the form of quills which, for retailing, are cut up into small pieces, or are ground into powder. The quills are usually about 3 ft. long. Cinnamon is graded into as many as eight classes known as "0000's," "000's," "00's," and "0," and 1, 2, 3, and 4 respectively. The "0000's" represent the finest description. The qualities range from a very fine type of pale bark to coarse kinds, and the prices likewise vary very considerably. Cinnamon is also sold in the form of chips and broken pieces produced in preparing the large quills.

Pimento and Cassia Lignea

Pimento is grown in the West Indies. It is commonly sold in ground form in retail shops as "allspice," because it is supposed to combine the flavours of cinnamon, nutmegs, and cloves. It is packed in bags containing about 1¼ cwt. each, and is sold in lots ranging from 5 to 50 tons. Like other spices, it is retailed in very small quantities, the housewife commonly buying it from the grocer in ounces. It is frequently used for flavouring cakes and puddings, including Christmas puddings.

"Allspice" is distinct from mixed spice, which represents a mixture of various ground spices. The latter is sold wholesale by spice grinders in this country.

Cassia Lignea is grown in China. It is a bark resembling cinnamon in aroma and flavour. Two well-known descriptions are "selected" and "broken," there being a considerable discrepancy of price in favour of the selected.

METALS AND MINERALS

XVII.—GOLD AND BULLION AND SPECIE

THE terms "Bullion" and "Specie" are often used somewhat loosely by business men not directly engaged in the marketing of these commodities. Bullion may be said strictly to mean gold and silver in the shape of bars or other unmanufactured form. The term "Specie" covers coins of gold, silver, or other metal.

There was a fine salvage of specie after the Spanish steamer *Alfonso XII.* was wrecked off Grand Canary in February, 1885, while carrying 100,000 Spanish gold coins, newly minted, each of which was nearly of the value of an English sovereign. Bullion was sunk when the liner *Egypt* was wrecked off Cape Finistere in May, 1922, while carrying gold and silver bars and also specie worth together £1,054,000. Not infrequently vessels carry both specie and bullion. Another case was that of one of the most famous of all wrecks—the sinking of the *Lutine*, off the Island of Terschelling, on the night of October 9-10, 1799. Estimates of the values of the gold and silver then sunk have varied very greatly. There is, perhaps, some possible explanation of the confusion between the terms in the fact that what is usually known as a specie bill of lading is employed for bullion as well as for coin.

Gold is found in almost every part of the world, although the principal sources of supply are South Africa, Australia, and India. It occurs either in block formations or as "alluvial gold"—that is to say, as gold washed out of the rock formation by the action of rivers and deposited in their beds.

Refining and Assaying

The gold, as extracted from the mine, reaches the market first in the form of impure bars. The impurities are those which exist in the gold at source and consist, principally, of silver and copper with, sometimes, lead, zinc, and other metals.

In order that these bars may be rendered marketable and represent "good delivery" for trade purposes, they must be refined. At some of the mines there are refineries, but the bulk of the crude gold, as mined, is shipped to one or other of the leading refineries of the world, the function of which is to convert the mine bars into fine gold bars. The refiner usually acts as a middleman and buys the crude bars, re-selling the resulting fine bars.

For the purpose of agreeing on the contents of the crude bar between the mine and the refinery, samples, or, as they are termed technically, "assay pieces," are submitted to an independent assayer. The "assayer" is really a specialist in the rapid analysis of gold and silver. His craft is centuries old. He reports his "assay" correct to one part per 10,000 parts. Payment is only made for the contents of gold and silver.

A typical assay of a crude bar of mined gold would be expressed thus:

Gold	9,426
Silver	410

The balance would consist of base metals. The figures indicate parts per 10,000 parts.

The refiner refines the crude gold to a fineness of 9,960 parts per 10,000 parts, or more, and to such a degree of perfection has refining been carried that fine gold bars are frequently "9,999 fine." The bar of fine gold produced at the refinery must again be assayed in order that its price to the purchaser may be agreed.

PRINCIPAL MARKETS FOR GOLD

As there are large and important refineries in London and the principal world bullion brokers and merchants reside there, the bulk of the world's gold, whether in the crude or refined gold, reaches London for disposal.

At one time London was supreme as the market for gold. In recent years, however, owing to the developments consequent on the Great War, it has shared that distinction with New York. Yet, for the reasons just indicated, most of the orders are placed in the London market.

The following sentence, extracted from a report of the bullion market in a daily paper, may be regarded as typical:—"Gold fell 4d. to 91s. 9d. per oz., ex London, and 91s. 4d., ex Durban." The difference in price represents, to some extent, the difference between a C.I.F. and an F.O.B. quotation, because the price in

London includes the cost of the freight and insurance on the gold from South Africa, which is the principal source of supply. Gold is sometimes sent direct from South Africa to India.

Gold Price Calculations

The quotation for gold as expressed above is always a quotation per ounce fine—that is to say, for theoretically pure gold—10,000 parts in 10,000. The greater part of the metal refined from South African or other gold is marketed in bars of 400 oz. each. Transactions on a large scale take place, therefore, on the basis of a unit of 400 oz. Bars, however, of half that size are specially manufactured for India, and gold is also made up into bars of only 10 oz. each for India and stamped with the name of the bank which imports them into that country. Small buyers of gold, who require one oz. or more, are supplied with gold in the form of granulations.

Each time gold is bought and sold a calculation has to be made, because the price is for fine gold, and each bar contains a small proportion of alloy which the refiner cannot extract. This proportion varies from 1 to 40 parts per 10,000. As a rule, each bar contains, on an average, 9,960 parts of fine gold per 10,000, and this degree of fineness, together with toughness and malleability, constitutes good delivery.

India is also a buyer of sovereigns, in which dealings take place in the London market at a premium equivalent, approximately, to the current premium on bar-gold over the normal price in London.

XVIII.—FINE SILVER

Silver is found in many parts of the world, but the great sources of supply are North, Central, and South America, Australia, and Burmah. Unlike gold, it is rarely found in the free form, being generally associated with sulphur, lead, and other base metals. As in the case of gold, it is shipped to London, either as crude silver or in the form of refined silver bars, according to whether it has been refined locally or not. Large numbers of silver bars are brought each week to London and are dispatched thence to all parts of the world. The East and Far East have always been large buyers.

The same processes of assaying and agreement must be carried through as with gold. Whereas, however, gold is reported correct to one part in 10,000 parts, silver is only reported to one part in 1,000. As in the case of gold, silver is only "good delivery" for trade purposes in the refined form, known as fine silver.

Bases of Silver Prices

Those few firms which deal, in a large way, in gold also specialize in silver. A representative report of the London silver market would be to the effect that "Silver remained unaltered at $34\frac{15}{16}$d. per ounce for cash and $34\frac{7}{8}$d. for forward delivery." Silver is usually marketed in bars of brick shape, each weighing

1,100 oz., or about 91 lb. (troy weight). Special calculations have also to be made each time silver is bought and sold, but of a reverse character to those necessary in the case of gold. The basis of the silver quotations is a standard of 925 parts per 1,000 parts of silver and alloy. This standard assumes, consequently, that there are 75 parts of alloy in each 1,000 parts, whereas the actual bars delivered contain at least 996 parts of fine silver in each 1,000 parts, and often as many as 999 parts.

Forward Delivery Transactions

By the term "forward delivery" is meant that the silver is to be delivered two months from the date on which the contract is made.

There is a large demand for silver in industry, and the wholesale prices of articles manufactured of metal vary, naturally, with the prices of the raw material. In the retail trade other factors come into play, such as the prices ruling when the stock was bought.

XIX.—PLATINUM: SPONGE, INGOTS, AND SLABS

Platinum may be described as one of the precious, or noble, metals, the best-known of the others being gold and silver. It is very much more valuable than gold, for, if the value of fine gold be taken at about 90s. per ounce, it is, at about £25 per ounce, more than five times as precious.

The chief source of supply of platinum is Russia, and supplies still continue to be produced in that unhappy country. The next largest source of supply is the Republic of Colombia, in South America, which has a substantial and increasing output. Smaller amounts are produced by Australia and the United States. Widespread discoveries of platinum have been made within the Union of South Africa, but the practicability of the successful development of these has still to be proved.

Platinum is found in association with iron and nickel in meteoric iron, and there exists in Arizona an immense deposit of such iron derived from the fall, at some unknown date, of a very large meteor, or mass of meteors. Platinum is found in this deposit to the extent of about one-quarter of an ounce to the ton, but there is thought to be little likelihood of its extraction on a commercial scale.

Association with Rarer Elements

Like gold, the metal is found "native" in the form of grains and nuggets in river gravels. Such deposits are termed "placer" or "alluvial." Platinum has, similarly, been found in rock, but unlike gold has, so far, not been profitably mined and extracted in this state. Native platinum is almost always found in association with rarer elements of its own group—namely, the metals iridium, rhodium, ruthenium, osmium, and palladium. The world market for platinum centres in London, and the price, like that of gold and silver, is quoted at so much per ounce troy. While, however, gold is usually marketed in bars of about 400 oz. each and silver in bars of 1,000 oz. each, there is no similar trade bar of platinum.

Platinum is sold in the form of sponge, ingots, or forged and partially rolled slabs. "Platinum sponge" may be described as being platinum in an amorphous form. It is produced by precipitation from a solution in the form of a salt, which is reduced to the metallic state when it is ready for melting by the purchaser. The ingots usually weigh from 10 oz. to 100 oz., according to the amount ordered by the buyer. The forged and partially rolled slabs are ready to be manufactured into sheet and wire, the next stage of fabrication.

Basis of Transactions

Transactions take place in Great Britain on the basis of 99.5 per cent. contents of pure platinum. Some of

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the members of the platinum group are even more valuable than platinum itself. Thus iridium, which is used as a hardener for platinum, now commands a higher price. Rhodium, osmium, and ruthenium are rarer still and have very limited uses, the quotations being nominal and subject to negotiation. Palladium has a somewhat extensive use, and is employed to a considerable extent in the jewellery trade, but although it is a rarer metal, its market price is lower than that of platinum.

Platinum is one of the heaviest of metals, its specific gravity showing that it is about twenty-one times as heavy as water. Its value in commerce rests upon its unique properties, which are its very high melting point—-between 1,700 and 1,800 Centigrade—and its resistance to almost every form of corrosion by acids and alkalies. It has great ductility, and can be drawn into wire so fine as to be practically invisible to the naked eye.

Main Uses of the Metal

The uses of platinum fall under three main headings—namely, in jewellery, in the electrical industry, and in the chemical trades. It has a particular value in jewellery, since its beautiful grey-white colour is considered to set off diamonds and precious stones better than gold. An important use in the electrical industry is in the production of contacts for magnetos. It is found that only this metal can satisfactorily resist the high temperature of the electric spark. To a decreasing extent, platinum is used in the electric lamp industry for leading-in wires. Owing, partly, to its high cost, it is now, in some cases, being replaced by various base metal alloys.

In the chemical trades its uses are many and varied. One of the most interesting is in the manufacture of artificial, or "synthetic," silk, which is described in Chapter XLIX. The "spinnaret" through which at one stage the substance, then in a liquid form, is forced is made of platinum.

The salts of platinum, of which the best known is platinum chloride, are chiefly used in photography. The silver-grey appearance of platinum prints is due to the use of this salt. Platinum combines with many elements, but the compounds formed are of scientific interest only.

Terms occasionally met with in industry are "Platinum Black" and "Colloidal Platinum." Each of these may be said to be platinum in an extremely fine state of subdivision, which is produced by chemical means. This finely divided platinum has very active properties, such as bringing about the immediate combination of oxygen and hydrogen. It is used, therefore, for automatic gas-lighting devices, etc. It also causes what are called "catalytic reactions," and for this purpose is largely used in the manufacture of sulphuric acid and various compounds of nitrogen from the atmosphere.

XX.—BOTTLES OF QUICKSILVER

Quicksilver, or mercury, is one of the commodities generally marketed in precisely the same form in which they leave the countries of origin, the exception to the rule, in the case of quicksilver, being the supplies which are mined in China. Since mercury is at ordinary temperatures in liquid form, it is generally marketed in iron bottles, sometimes known as "flasks."

These heavy receptacles are usually made of wrought iron and weigh, when empty, from about 10 lb. to 15 lb. each. They measure about 12 in. high and are about 5 in. in diameter. Each bottle, as a rule, contains from 75 lb. to 76 lb. of quicksilver, making the total weight of the contents and the container about 90 lb. Steel, which was once used, was found to break. The iron stoppers are screwed into the mouths of the bottles very securely indeed, so that to open the containers strong chain grips and powerful spanners are needed. Cases have sometimes occurred—notably of bottles exported from Mexico—in which the iron stoppers have been so firmly fastened, in order to prevent any leakage, that holes have had to be drilled into the iron sides to secure possession of the contents. The heavy weight and the small size of the containers make the sea transport of mercury as freight attractive.

The bottles are not packed in cases, but are transported separately to all parts of the world in the same state in which they leave the countries of production.

WIDE FLUCTUATIONS IN PRICE

Mercury is usually sold per bottle of from 75 lb. to 76 lb., subject to the provision that it shall be "pure virgin quicksilver of good merchantable quality." Its prices are almost as mercurial as that of the metal in barometers. They fluctuate frequently and widely—by several pounds sterling a bottle. Production keeps, as a rule, in close step with the demand, and experience has shown that when the price rises above a certain level the demand at once falls off. When fresh supplies are forthcoming from the mines and the price falls, the demand again increases.

CHIEF SOURCES OF SUPPLY

Quicksilver is extracted from cinnabar ore, the chief sources of supply of which are Spain and Italy. The Almaden mines in Spain are the largest in the world, and quicksilver is now shipped from Spanish ports, such as Seville, to all parts. Until after the Great War the bulk of the Spanish production was sent to London and redistributed thence, but, owing to freight difficulties, a beginning was made with shipments direct to other countries, and this procedure has continued. London remains, however, the chief market of the world for quicksilver, and although all the supplies do not now pass through the City of London, the greater part of the buying and selling takes place there, and supplies are held in London.

In Italy there are important mines at Idria, Amiata, and Siele respectively. At one time the United States was the largest producer of the liquid metal, but owing to the poverty of the ore the output has declined, and the United States now takes third place as a producer. The annual production of Italy, to which Amiata contributes most, may be put at about 55,000 bottles; Spain, with the large Almaden deposits of cinnabar, contributes about 35,000 bottles annually; and the annual production of the United States is about 10,000 bottles.

Collection in China

In China the metal is collected by a large number of individuals, who melt it themselves and store it carefully in sealed strips of hollow bamboos. Quite small quantities are stored in this way, bamboo tubes of varying diameter being used for the purpose. Then, when a few pounds or so have been collected, the natives sell the metal to the firms dealing in the commodity.

Uses of the Liquid Metal

Quicksilver is largely used in the manufacture of mercurial salts for medicinal and other purposes. Its employment in barometers and thermometers is well known, although the actual amount of the metal used for these purposes is probably far smaller than might be expected. A little goes a long way in more senses than one, and one bottle of standard size would probably last a firm of makers of such instruments a considerable time. It is largely used in the manufacture of vermilion paint and in the production of compositions for painting and the bottoms of ships. The mercury prevents corrosion and, being a poison, kills barnacles, which are apt to adhere in immense quantities to the sides of ships. So, although expensive, it is much used for this particular purpose.

Quicksilver is employed on a fairly large scale in the production of fulminate of mercury in the explosive manufacturing industry. It also has its place in the gold mining industry of South Africa.

Dealing in quicksilver is a highly specialized business and rests in very few hands. Thus it is estimated that from 70 to 80 per cent. of all the transactions in quicksilver throughout the world are carried through by the leading firm in London.

XXI.—GRADES OF PIG-IRON

Dealings in pig-iron are quite free and are the subject of direct negotiation between buyers and sellers. There have in recent years been attempts to revive the market in pig-iron warrants on both the London Metal Exchange and the Glasgow Exchange, but these attempts have not been successful.

Before the Great War there were large transactions in pig-iron warrants, the chief market in which was at Glasgow. Each warrant represented a certain quantity of iron—usually 500 tons—of an approved brand, and was held against a similar tonnage of the same quality in a public store. The chief stores were those of Messrs. Connal at Glasgow and Middlesbrough. So important were these transactions that the price of pig-iron was controlled by the warrant market, which was commonly known as the " Pig-Iron Ring."

Process of Manufacture

After the ore extracted from the earth, pig-iron represents the foundation of the iron and steel industries. It may be defined as the product of iron ore, limestone, and coke, and is obtained by means of the blast furnace. In the process of this first stage of manufacture of iron, coke is used as the " bed," and ore and limestone are known as the " burden." The coke is set alight and the burden is slowly burned. The air blast is then turned on and reduces the ore in the burden to a molten state. In this condition the iron falls to the bottom of the furnace and is "tapped" (run out) into sand-beds previously prepared. The molten iron runs along these sand-beds into position and gradually becomes solidified into lumps of iron known as "pigs," owing to their appearance. These pigs are usually about three feet long and weigh, approximately, one cwt. The term "sows" is used to signify those portions of the iron which join the pigs together in the sand-bed. "Runners" represent the main channels in the bed.

Three Main Descriptions

Pig-iron falls into three main groups, which indicate by their names the principal uses of the metal. These descriptions are: (1) Steel-making Pig-Iron, (2) Foundry Pig-Iron; and (3) Forge or Puddling Pig-Iron.

Steel-making pig-iron is produced in two forms—namely, hematite and basic. Hematite iron is used chiefly in the manufacture of steel by the acid process and is produced from iron ore low in phosphorus. This type of ore is found chiefly in Lancashire and Cumberland, and largely in Spain, whence very considerable exports are made to the United Kingdom and Germany. Basic iron is used in the basic furnace and is produced from ores containing a high percentage of phosphorus. These types of ore are found in South Wales and Lincolnshire, are exported from Wabana, Newfoundland, to Europe, and exist in the famous Minette deposits in Alsace-Lorraine, on which the Continental iron and steel industry is mainly built. Basic iron, after treatment in the furnace, yields a valuable by-product in basic slag, which is sold for agricultural purposes.

Features of Different Deposits

Foundry Pig-Iron, as the name implies, may be described as iron used in the manufacture of castings, the number of types of which is very great. It is found in various districts in Great Britain, the deposits varying in the precise constituents which render them suitable for particular purposes. Thus Scotch pig-iron is well known to be specially suitable for high-class machinery castings, while Cleveland (or Middlesbrough) iron is noted for the manufacture of cast-iron pipes and stoves. Foundry pig-iron is almost invariably graded in Great Britain by fracture, rather than by analysis, into four grades denoting quality, known as 1, 2, 3, and 4 respectively. Thus it is common to speak of No. 1, No. 2, or No. 3 Middlesbrough, or Scotch, or other brands. The iron is usually branded according to the district in which it is produced.

Production of Blooms

Forge Pig-Iron may be described as iron used in the manufacture of bar iron in the puddling furnace. There it is melted into large iron blooms which are hammered into reasonable size and are then put through the rolling mills to be rolled into bars, shapes, etc.

In addition to the three main divisions of pig-iron described above, there are other less important forms, such as white or mottled iron and cold blast iron.

Mixed Numbers

The term "G.M.B.," which is commonly applied to pig-iron in contracts, is a contraction for "Good Merchantable Brand." A somewhat similar term is, it may be pointed out, used in the standard contract approved by the Committee of the London Metal Exchange for dealings in tin and spelter. In each district certain brands of pig-iron are understood to come within this description. Thus "No. 3 G.M.B. Middlesbrough" would include such brands as those of Cleveland, Redcar, and Newport.

The term "Mixed Numbers" is applied, chiefly, to weights of hematite iron consisting of grades Nos. 1, 2, and 3 in equal quantities.

XXII.—MILD AND HARD STEEL

In the last chapter, in which the principal terms used in connection with iron were discussed, it was pointed out that the first of the three main divisions into which pig-iron falls is " steel-making pig-iron," and that this type is produced in two forms—namely, hematite and basic. From these two forms of pig-iron are produced all the many varieties of steel which, in the last seventy-five years, have so largely replaced iron.

Iron is now mainly used only for those particular purposes for which its fibrous character is more suitable. An outstanding example of the replacement of iron by steel is in the construction of ships, and so the costs of building ordinary cargo steamers are now based, primarily, on the price of ship plates. Prices of ship plates are commonly given in the reports of the market in steel products. Ship plates, boiler plates, steel sheets, and the various products known as shapes and sections are bought and sold for use in this country and abroad.

Buildings of any size are now, as a rule, constructed largely of steel, in the shape of beams, girder-plates, and reinforcing-rods. Other directions which at once suggest themselves in which steel is a highly important factor lie in the construction of bridges, railways, locomotives, waggons, and motor-cars. For most of these purposes what is known as "mild steel" is used.

Constituents of Steel

Steel may be defined, in the simplest way, as a combination, chiefly, of iron and carbon. "Mild steel" is that in which the proportion of carbon is low. It varies from ·12 to ·2 per cent. "Hard steel," on the other hand, is that in which the proportion of carbon to iron is comparatively high. It ranges from ·7 to ·8 per cent. In what is known as "tool steel," in which exceptional hardness is essential, the proportion of carbon is still higher, and ranges from 1 per cent. to as much as 1·3 per cent. Mild steel is normally the first product of manufacture, and if steel with a higher proportion of carbon is wanted spiegeleisen is put into the furnace in quantities varying according to the proportion of carbon required. Apart from the fact that steel is cheaper than iron and can be produced more rapidly, an advantage of its manufacture is that it can be obtained in numerous qualities, according to the purpose in view.

Processes of Manufacture

Steel is largely produced from pig-iron by what are known as the acid and basic processes. Each of these is carried out by the Bessemer or Siemens (or open-hearth) methods, which are named after their inventors. Of these the Bessemer method is much the oldest. In the Bessemer method hematite pig-iron is melted in a cupola and is then run into a "converter." At the bottom of the converter are arranged "tuyeres" or blow-holes, and when the molten iron is ready a blast of cold air is forced through the tuyeres to the metal at high pressure. This has the effect of removing the impurities, consisting of manganese, silicon, and carbon, and, at the same time, of oxidizing the iron. The latter is then transferred from the converter, which can be tilted, into ladles and, by a chemical process brought about by the addition of ferro-manganese, becomes steel.

Blooms, Billets, and Bars

This steel, while still in liquid form, is cast into ingot moulds, where it is allowed to solidify and form into ingots. These ingots are afterwards taken from the moulds and put in what are known as "Soaking Pits," which are built of a special quality of bricks and retain heat. In these pits the ingots give off heat and are brought to a uniform temperature. They are then taken from the soaking pit to the cogging mills and are there "cogged" down to blooms, billets, and sheet bars. Blooms and billets may measure from 3 ft. to 30 ft. in length. The billets measure from 2 in. to 4 in. square in section and are rolled down into the smaller sections of round, square, and flat bars, and the blooms, measuring over 4 in. in section, are used principally for the manufacture of heavier materials, such as joists, channels, and rails. Sheet bars are flat and from 6 in. to 12 in. wide, and from these bars are rolled steel sheets from ⅛ in. thick to gauge 30, as required.

Blooms, billets, and sheet bars are known as "Semi's," or semi-manufactured steel. From the cogging mills they are sent to the various rolling mills to be manufactured into the different products. In the basic method, for which basic pig-iron is used, the converter is lined with basic material in the form of bricks of dolomite, which enables pig-iron high in phosphorus to be used, whereas under the acid process hematite alone can be employed.

THE SIEMENS SYSTEM

In the Siemens system, which is now largely employed, the furnace for the acid system is charged by putting in the pig-iron in the form of pigs, instead of in the molten state as in the Bessemer method. Scrap steel is then added. When the metal is melted hematite ore is added and oxidizes the carbon. Subsequently ferro-manganese is added to convert the iron into steel. The difference between the Siemens basic and acid processes is that in the basic method the furnace has a basic lining, which, again, is generally made of dolomite. In the basic process high phosphoric pig-iron is used as in the Bessemer basic method.

There is a third notable method of manufacture of steel, namely, by the electric furnace, but doubts exist as to whether this process will ever become of equal importance to the others for general purposes.

XXIII.—STEEL PRODUCTS AND SCRAP

FIRST products of the steel furnaces are ingots, from which are produced sheet bars, blooms, billets, and slabs. From the blooms and billets are rolled smaller bars. From the latter are manufactured such products as joists, angles, and channels, which are included in the term "Sections."

From the slabs are rolled steel plates, including boiler-plates, used in the construction of ships and their machinery and for other purposes, and from sheet bars are rolled "steel sheets." The latter are of thicknesses ranging from $\frac{1}{8}$ in. to gauge 30 which, as explained in Chapter XXIX. in connection with tinplates, is equivalent to ·0123 in. A common thickness is $\frac{1}{8}$ in. (about gauge 10).

STEEL STRIP AND SOFT STEEL

"Steel strip" means a thin flat bar, usually of gauge 10 or thinner, and measuring from 1 in. upwards in width. It is used in the manufacture of small gas and water-tubes and pipes. In the United States the term "skelp" is used to signify this product.

The word "soft" is often used in association with the term "mild" to signify steel in which the proportion of carbon is low, and the prices of "soft steel billets," representing soft mild steel, are often recorded in market reports. The term "dead soft steel" means steel in which the proportion of carbon is of the lowest possible amount. Very soft steel is sometimes used for the component parts of machinery. It is less brittle than hard steel and is more readily welded.

Hard and High Speed Steel

Sheffield is the home in this country of the hard and special qualities of steel such as tool, malino, high speed, and stainless types. Saws, files, chisels, drill steels and scissors, knives, razors, and many other articles in common use are manufactured in the Sheffield district. Outside that district the great production in this country is of the mild quality. The foundation of much of the special descriptions of steel made in Sheffield is "crucible steel," which, as the name implies, is steel produced in a crucible furnace.

It will be recalled that the main addition to iron in the manufacture of mild or soft steel is carbon. In order to produce the fine "temper" needed in hard steel, certain alloys are added. The term "high speed steel" is used to signify steel which is melted in the crucible or electric furnace. It generally contains comparatively large quantities of tungsten and chrome and a small amount of vanadium, which impart to the steel increased resistance. High speed steel may, indeed, be described as an alloy steel.

"Stainless steel" is steel which has been specially prepared to be proof against stains of any kind. Nickel and chrome are used in its composition in the proportion, as a rule, of about 15 per cent. of chrome and 1 per cent. of nickel.

The Trade in Scrap Steel

"Discard steel" is a term applied to the ends of ingots and billets which are cut off to ensure the soundness of the products. Sometimes the discard steel is rolled down into sections and bars, and at other times it is used as "scrap."

A large source of the supply of scrap steel lies in the breaking-up of ships. It is also obtained when steel buildings are demolished and factories are dismantled. The sizes in which scrap steel can be dealt with are governed, mainly, by the size of the furnace doors through which it has to be passed to be melted down again. As a rule, the maximum size of the pieces measures 5 ft. by 2 ft. by 1 ft. 6 in. Pieces within these limitations are known as "handy furnace sizes."

Types of Scrap Steel

Ordinary steel scrap to be melted down again in the furnace is known as "heavy scrap steel." As pointed out in the previous chapter, it is usual to add "scrap steel" to the pig-iron in the Siemens acid process. Iron and steel scrap mixed can only be used in the basic open-hearth or Siemens method of manufacturing steel.

"Compressed steel scrap" consists of various forms of light steel products which have served their first purpose and are put under hydraulic presses, which force all the different pieces and articles into a solid mass. Sometimes this is produced in the shape of a billet and sometimes in that of a ball. "Nickel chrome scrap" represents armour plating, mostly from warships, and is used by the great armament firms for their particular manufactures.

"Detinned scrap" is the product of treating tins which have been used for such purposes as the containers of sardines, preserved meat, fruit, etc. From the dustbins of innumerable houses the used tins find their way to the destructors or the factories where, by means of a chemical process, the tin and solder are removed and afterwards sold, and the remaining steel is compressed in the fashion just described and is melted down again to be remanufactured in various forms. The trade in old tins is a source of revenue to town and borough councils.

XXIV.—STANDARD COPPER

Copper is mined in many countries. The largest production is in the United States, while Mexico is also an important source of supply. Chile produces large quantities, and Spain and Portugal contribute notably to the world's supplies, the Rio Tinto Mine in Spain being one of the most famous copper-mines in the world. The African production has been expanding as the result of the developments at Tanganyika, and is likely to be an increasingly important factor during the next decade, especially as transport is improved. Australia still exports copper, but not on so large a scale as in the past. There are important copper refineries throughout the world.

By copper matte is meant an intermediate product between the ore and the refined copper. It contains, as a rule, from about 25 per cent. to 50 per cent. of pure copper.

The term "primary copper," which is sometimes used, means copper smelted from ore and excluding re-smelted or scrap metal.

Basis of London Dealings

All dealings in copper and tin on the London market take place on the basis of what is known as the "Standard" contract. The term "Standard" covers a variety of descriptions of the two metals, and before explaining precisely what is meant by the phrase it will be desirable to define the individual descriptions.

"Refined Copper" is copper which has been treated at a refinery and assays not less than 99 per cent. of pure copper. It is sub-divided into three classes, known as "A," "B," and "C" respectively. "A" assays not less than 99 per cent., and below 99·30 per cent. of pure copper; "B" assays not less than 99·30 per cent. and below 99·80 per cent., and "C" assays not less than 99·80 per cent. of pure copper.

"Rough Copper" is that which has been smelted but not refined. "Tough Copper," which is sometimes in the form of "Tough Cake," is refined copper used for rolling into castings, etc. What is known as "Best Selected Copper" is a higher grade of refined copper than "Tough," averages 99·75 per cent. of fine copper, and is employed largely in the manufacture of brass.

"Electrolytic" copper, appearing largely in market reports, is copper refined by the electrolytic process and possessing a high conductivity.

Descriptions of Electro Shapes

Under the general heading of "Shapes" electro-copper is deliverable as wire bars, which are so fashioned that they may be drawn out into copper wire; of ingot bars, which consist of two or three ingots joined together or of bars clefted; of ingots, the usual weight of which is from about 18 to 23 lb.; of cakes, weighing 100 lb. and upwards, used for rolling; and of cathodes. The last-named represent copper from the electrolytic tanks which is run down to wire bars, etc. Dealings in copper on the London Metal Exchange take place in units, known as "warrants," of multiples of 25 tons. In tin these warrants are of 5 tons, in lead of 50 tons, and in spelter of 25 tons.

The Standard Market

The simplest description of "Standard Copper" is "any description of copper deliverable against a standard contract." Reference to this form of contract shows that four descriptions are so deliverable—namely, the "A," "B," and "C" classes of refined copper ("B" including "Tough Cake"), and class "D," which signifies Rough Copper. The price basis is class "A" of refined copper. If class "B" is delivered the buyer pays 10s. per ton over the contract price; if class "C" is delivered there is an addition of £1 per ton to the contract price; and if "D" ("Rough Copper") is supplied, a rebate of £1 10s. per ton is allowed, subject to further allowances for deficiencies. The prices of the various grades thus move automatically in accordance with the price basis for class "A."

The legitimate use of the Standard market is as a hedging medium, while the market is also largely used for speculative purposes. By using the market as a means of hedging producers and other holders are, by selling "Standard," able to ensure the current price for their copper over a period. Conversely, consumers and dealers are, by buying Standard against their forward requirements, able to secure the metal at the ruling parity, the transaction being completed by their closing their Standard commitments when they are prepared to take or give delivery of the actual metal.

System of Dealing

Dealings on the Metal Exchange in London are confined to copper, tin, spelter, and lead. All the metals in which transactions take place on the Exchange have been smelted—*i.e.*, there are no open dealings in the ores as they are extracted from the mines. The metals dealt in are in a virgin state, as in the form of ingots, etc. The smelting and subsequent refining processes after the ores have been mined are carried out in either the country of origin or in the country of consumption.

Dealings in copper take precedence in the comparatively short mid-day session on the London Metal Exchange. This lasts only from noon until 1.20 p.m. There is no afternoon session on the Exchange, although dealings on a large scale may, and do, take place in the afternoon between the various firms, in which the telephone plays an important part, just as transactions in stocks and shares are carried out between Stock Exchange firms after the official closing of the Stock Exchange. Incidentally, firms on the Metal Exchange, when acting as brokers, are also principals in the transaction. They also, for the most part, carry on business as merchants.

Division of the Session

The method of dealing on the Metal Exchange is for members to sit in a circle, where they call out the prices at which they are prepared to buy or sell the different metals, and they must then accept the best offers or bids that are made. The session is divided into periods of ten minutes each, for the first ten minutes—from noon until 12.10 p.m.—transactions are confined to copper and also again from 12.30 p.m. until 12.40 p.m. Tin holds the hall from 12.10 p.m. until 12.20 p.m., and again from 12.40 p.m. until 12.50 p.m. From 12.50 p.m. until 1 p.m. only spelter is dealt in, and from 1 p.m. until 1.10 p.m. only lead. In the final session of ten minutes from 1.10 p.m. until 1.20 p.m. dealings may take place in either tin or copper. There is no session on Saturdays.

XXV.—TIN ORES AND SLABS

The Federated Malay States are the principal source of supply of tin. Bolivia has ranked second, with the Dutch East Indies in 1923 and 1924 running it very close. In the case of exports from some countries dealings take place on the basis of slabs of tin, whereas exports from other countries in which smelting is not carried out are always in the form of ore. The Straits Settlements export tin in slabs, but Bolivia and Nigeria only tin ore. There is large smelting capacity in the Straits Settlements—that in Great Britain ranks next with the Dutch East Indies, China, and the United States following. At one time the Cornish production was an important factor in the world's supply of tin. Now, although a good deal of smelting is carried on in Cornwall, the output of tin ore there is comparatively insignificant.

Qualities of Chinese Tin

Tin found in China comes mainly from the Yunnan Province, where it is primarily smelted into flat slabs of 70 lb. weight. In that state it is known as "Yunnan Rough," and contains from 70 to 90 per cent. of tin. It is brought by rail and water to Hong Kong, where it undergoes a final smelting process by old-fashioned Chinese methods and is shipped thence in the form of heavier ingots. Of these there are three qualities known as No. 1, No. 2, and No. 3 respectively.

Of these No. 1 contains 99 per cent. of tin; No. 2, 98 per cent.; and No. 3, 96 per cent., but the bulk of the tin is of No. 1 quality. The different qualities are passed by the Hong Kong Government or other recognized analyst. Chinese tin also comes from Kwangsi, and is largely used in the manufacture of alloys. When mixed with tin from the Straits Settlements it is used in the production of tin plates. Its fluid characteristic makes it much liked for particular purposes. Some types of tin are very sluggish.

It may be noted that in the East it is common to speak of slabs of tin, which weigh about one cwt. In England the term "ingots" is used, while in the United States it is common to speak of "block tin" or "pig tin."

Standard Tin

"Standard tin" may be defined briefly in a similar way to "standard copper"—namely, "any description of tin deliverable against a standard contract." Reference to the standard form of contract shows that standard tin is divided into two main classes, known as "A" and "B" respectively. In class "A" are Straits, Australian, Banka, and Billiton tin, and English refined tin of good merchantable quality at contract prices, Banka and Billiton being islands in the Dutch East Indies. Included also in class "A" is "other refined tin of good merchantable quality, assaying not less than 99·75 per cent. of pure tin at contract price."

In class "B" are common tin in ingots or slabs of good merchantable quality, assaying not less than 99 per cent. of pure tin, subject to a rebate of £5 per ton from contract price.

The term "common ingot" is used to describe English tin of a guaranteed purity of 99 per cent., the ingots varying in weight from 14 lb. to 56 lb. Slab tin is tin cast in slabs as opposed to ingots, and varying in weight from 80 lb. to 112 lb.

By the term "English refined tin" is meant tin resulting from the smelting of ore, whether the latter be produced in England or is imported, the purity of the resulting product being about 99·75 per cent.

The Market in Standard Tin

As in the case of copper, the standard market in tin is used in ordinary trade for hedging purposes, sellers being able to assure themselves of the prices ruling at the day in which the contract was entered into for delivery three months hence, and consumers likewise being able to assure themselves of supplies, three months hence, at the price current at the opening of the transaction. As on the Stock Exchange, there are dealings on "puts" and "calls." When an option to put is acquired by the payment of a comparatively small fixed sum, the buyer of the option is able to put on the seller the named quantity of metal at the agreed price, and, similarly, when a "call" option is acquired the buyer has the right to call from the seller the named quantity of metal at the specified price. The system is also largely used for speculation, and in this connection there are double options under which the right either to put or call is acquired.

XXVI.—GOOD SOFT PIG LEAD

Lead is produced in many countries, by far the largest output being in the United States. Mexico, Australia, and Spain are the next important producers. In Europe Belgium and Germany have important lead-mines. Canada is also among the chief producers of the world, and the output of Burmah, from which much is expected in future, has been steadily increasing.

The form of contract in the case of lead approved by the Committee of the London Metal Exchange provides for "good soft pig lead." This may be defined as virgin lead smelted from ores and having a minimum purity of about 99·8 per cent. The word "pig" in this connection means a lump of lead and derives its name from its shape. The weight of a pig is approximately 112 lb. Sometimes, although not as a rule, in the trade itself the alternative term "ingot" lead is used.

In the good soft pig lead contract, shipment is understood to mean by steamer due to arrive between the tenth day of the month named in the contract and the ninth day of the following month. Lead actually on board a steamer and shipped at a port in Spain, the Mediterranean, or on the east coast of the United States of America during the month named, is a good delivery, irrespective of arrival date. The seller may fulfil the contract by making delivery ex-wharf not earlier than the tenth day of the month named for shipment and not later than the ninth day of the following month.

By the term " Bar Lead " is signified a size manufactured to meet the convenience of certain users who need to handle small quantities. The weight of a " bar " of lead is about 7 lb.

" Sheet Lead " is lead cold-rolled into sheets for building purposes. These sheets usually measure 32 ft. by 8 ft., but they are also manufactured into any other size required.

OTHER TYPES OF LEAD

The term " Desilverized Lead " means, as the words imply, lead from which silver, which is often found in association with lead, has been extracted.

" Antimonial Lead " is manufactured in two grades. One is a pure mixture of antimony and lead, containing from 12 to 15 per cent. of antimony, and is used chiefly for type-metal. The second grade is a by-product of the desilverizing process, and contains from 8 to 20 per cent. of antimony.

Besides being sold in the form of sheet lead, manufactures of various types are marketed, such as yarn (for caulking iron pipes) and solder. Lead is also used for the production of certain paints and glazes and for electric batteries. The enormous number of wireless installations throughout the world has meant a great demand for lead for this purpose.

XXVII.—SPELTER, CONCENTRATES, AND ALLOYS

Spelter is produced from zinc ore, and when it is manufactured the word "zinc" is again used. Thus there are zinc sheets.

Zinc ore is produced on a large scale in the United States, which has the largest individual output in the world, and in Europe. Among European countries Belgium is the chief producer, with Germany second. The United Kingdom has important supplies, and Australia and Canada are among the chief producers in the world.

Good Merchantable Virgin Spelter

Spelter deliverable under the form of contract approved by the Committee of the London Metal Exchange must be virgin spelter of good merchantable quality resulting from the distillation or electrolysing of zinciferous materials. In the spelter contract "shipment" is understood to mean shipment by a steamer due to arrive within the month named in the contract or on or before the fifth day of the following month. Spelter actually on board a steamer and shipped at a port in Europe or on the east coast of the United States of America during the month named is a good delivery, irrespective of the arrival date.

The term "Concentrates" is applied to ore which has been heated to bring it up to its highest metallic content. Before the Great War large quantities of concentrates were exported from Australia to the Continent of Europe, where they were treated. Now, however, arrangements are in force for treatment of the concentrates in England, notably at Avonmouth.

Brass is an alloy of copper and zinc, while bronze is an alloy of copper and tin, with small additions of other metals, especially zinc. Gun-metal is a form of bronze.

The term "Secondary Metals" includes all metals other than gold, silver, iron, copper, tin, lead, and spelter, which are termed the "Primary Metals."

NORWICH PUBLIC LIBRARIES

XXVIII.—ANTIMONY REGULUS

Although high-grade antimony ore does not occur in appreciable quantities in Great Britain, that country certainly leads the world in the refining process. By general admission, there is no refined antimony manufactured outside Great Britain which reaches the high standards of the leading English makers, and refined antimony is shipped thence to all parts of the world. There is also a large internal demand for the metal.

Antimony is always found in the form of ore and, mainly, as "stibnite," in association with sulphur. A considerable amount of antimony oxide ore is also found. The ore supplies are widely distributed, the most important bodies occurring in China, Bolivia, Mexico, and Burmah.

Stibnite and Antimony Crude

A good sulphide ore, or stibnite, contains from about 50 to 60 per cent. of antimony—*i.e.*, about 80 per cent. of antimony sulphide. Such an ore, in the English process of refining, is first liquated under heat, when the antimony sulphide melts and runs off, leaving the rest of the ore, or "gangue," behind. The antimony sulphide produced contains about 70 per cent. of antimony, and is known as "antimony crude," or "needle antimony." This antimony crude is then smelted with iron scrap, when iron sulphide is formed, and metallic antimony, known as "antimony regulus," is released. In China the sulphide ore is usually roasted to oxide, and then reduced to metal by heat with carbon, following the normal practice for oxide ores.

The standard ordinary antimony is chiefly produced in China, and is sold as "Chinese Antimony regulus, 99 per cent., Good Merchantable Quality." In England, however, the refining process is pursued still further, and the best brands of English manufacture are guaranteed to contain as much as 99·6 per cent. of pure antimony, and frequently give a considerably higher percentage. The metal is marketed in flat cakes, weighing about 32 lb., the surface of the cakes of the purest grades showing usually a fine crystalline appearance. For this reason, refined metal of this kind is frequently termed "Star antimony."

The ordinary market quotations refer to the "Chinese regulus 99 per cent.," while English special brands are also quoted—at a premium, of course, over Chinese grades. Occasionally, inferior Chinese metal finds its way to the market, the purity being usually described as from 98 to 99 per cent.

Principal Uses in Industry

Antimony is a hard brittle metal, and is exceptional in that, when alloyed with certain other metals, it imparts to the alloy the property of expanding on solidification. This quality gives antimony a great value in the manufacture of type metals, in the production of which, in times of peace, antimony finds one of its principal uses. A high grade of type metal used in printing machines would contain about 85 per cent. of lead, 10 per cent. of antimony, and 5 per cent. of tin. The precise proportions of these constituents of type metal vary according to the machines for which they are intended, but in every case there will be a percentage of antimony, which is largely responsible for the sharpness and clearness of the printed letters.

Bearing Metals

An important function of antimony, particularly in Germany and the United States, is in the manufacture of bearing metals. Such metals consist mainly of lead and antimony, the antimony conferring on the alloy the essential property of hardness.

Safety Matches and Pigment

Antimony crude, in powdered form, finds a world-wide use in the manufacture of safety matches. Both the sides of the boxes and the heads of the matches generally contain a percentage of powdered "crude antimony," or, as it is commonly called, "black powdered antimony." The same material is largely employed for fireworks.

Of recent years one of the leading firms in Great Britain has been developing the manufacture of antimony oxide as a white pigment. Paints and enamels made from antimony oxide are non-poisonous, and are claimed to have certain advantages over paints made from zinc oxide and white lead. The adoption of antimony for this purpose is comparatively new and is showing steady increase and development.

The pure sulphides of antimony are valuable as red colouring matter for rubber. The colour of the inner tubes of motor tyres, red surgical rubber, red hot-water bottles, etc., is mainly obtained from the use of golden or crimson sulphide of antimony.

A Component of Shrapnel

In war-time antimony assumes a special importance by reason of its use in shrapnel metal. This consists of lead, alloyed with about 12 per cent. of antimony. Here, again, the addition of antimony converts the soft lead into a hard alloy of considerably greater penetrating power. There is no doubt that during the Great War Germany seriously felt the need of antimony, supplies of which were prevented by the Allied blockade from reaching her. So great was her need for the metal that, in the later stages, German shrapnel bullets, which were analyzed, were found to have been made from remelted type metal.

In conjunction with other metals antimony is used in the manufacture of Britannia metal, Babbit metal, and other industrial alloys.

XXIX.—BLACKSHEETS AND TINPLATES

ALTHOUGH tinplates are not dealt in on the London Metal Exchange, it is appropriate now to define the meaning of the term and of similar words.

" Blacksheets " are generally understood to be made of mild steel in thicknesses ranging from gauge 30 to $\frac{3}{16}$ of an inch, in sizes of about 3 ft., or slightly more, in width and length as required. Since gauge 30 is equivalent to ·0123″, it is clear that the thickness of the thinnest plates is infinitesimal.

" Blackplate " is the technical term for a blacksheet which has been pickled in acid, and sometimes also cold-rolled. The latter process gives the polished surface required for tinning, and the pickling does the necessary cleaning, etc. The term " P. and C.A. blackplate " implies a blackplate which has been pickled and close-annealed, and the term " P.C.R. and C.A. blackplate " signifies a blackplate which has been pickled, cold-rolled, and close-annealed.

" Tinplates " are thin steel sheets covered with a very thin layer of tin. The standard size measures 28 in. by 20 in., with a gauge of 30. Both thinner and thicker sheets are, however, made, and in surfaces somewhat larger or smaller, according to the particular purposes for which they are to be used.

"Galvanized sheets" are blacksheets which have been covered with a thin layer of spelter, sometimes called zinc. The term "zinc sheets" is at times incorrectly used when galvanized sheets are meant, for zinc sheets consist of spelter only and are employed for quite different purposes. Galvanized sheets may be either plain or corrugated. The term "galvanized iron" is also commonly misused, for nowadays galvanized sheets are almost invariably made of steel.

"Terneplates" are iron or steel sheets coated with an alloy of lead and tin.

XXX.—ALUMINIUM: CRUDE, SECTIONS, AND SCRAP

Aluminium may be described as the metallic basis of a large number of salts. It is contained, in the form of alumina, in many types of clay and rock and mineral, including some precious stones. So widespread is the substance that it is said that even the dust on the roads contains a percentage of aluminium.

The metal exists largely in alum, which consists of a double sulphate of aluminium and potassium. Although aluminium is so widely scattered over the crust of the earth, the process of extraction is costly, and so the production of the metal is kept within limits. Subject to this consideration of the expense involved in treating the substances in which it is present in important proportions, there should never, however, be any lack of the metal.

At the present time aluminium is always extracted by the electrolytic process, which requires a large amount of electric current. The production of aluminium tends, therefore, to be centred in those countries and districts in which large supplies of the raw material are available and water power is plentiful and cheap.

Treatment of Bauxite

The mineral which is chiefly used as a source of supply of aluminium is bauxite, which was first employed by the mineralogist Berthier at Baux, near Arles, in France. This earthy mineral may be either white or red in appearance and contains alumina, ferric oxide and silica, together with other substances in varying proportions. Actually, red bauxite is employed because of its high content of alumina and low content of ferric oxide and silica.

Deposits of bauxite exist in various parts of the world. The largest and richest are in France and the United States, which are also favoured with the extensive water power necessary for the economic conduct of the industry. Aluminium likewise exists in corundum, a natural oxide of aluminium, and as silicate and fluoride, which contain sodium and potassium as well as aluminium. Bauxite is imported from France for the alumina works in Scotland and Ireland, where the alumina is extracted. This is consigned to the reduction works in Scotland and Norway, and the resulting metal, in its crude form, is then sent to rolling mills in Great Britain. Suitable water power is available for the industry in Switzerland and Canada, besides Scotland and Norway.

The term alumina is given to the simple oxide of aluminium, which is derived from bauxite by a chemical process. After calcining, or roasting, the alumina is put into the electrolytic bath for reduction to the metallic form.

Characteristic Features

An outstanding characteristic of aluminium is its lightness. Its strength is increased, when necessary, by alloying it with other metals. It is ductile, and so can be easily manufactured—spun, pressed, stamped, or hammered—into intricate shapes. This quality renders the metal particularly adaptable for use in motor-cars and in the manufacture of cooking utensils. In cooking its high heat conductivity and cleanliness are of special merit. The country which uses the greatest amount of aluminium is the United States, where immense quantities of the metal are required for the motor and electrical industries.

In Great Britain the two companies specializing in the production of aluminium deal in the metal in its various stages ranging from alumina for reduction into the metallic form to a series of semi-manufactured products.

The term "Crude Aluminium" is applied to ingots and notched bars. In its generic use the term ingots includes wire bars, tube billets, and rolling slabs, but it is used more particularly to signify bars of alloy, which have only three notches. The ordinary notched bar consists of a bar with notches in between which it may be cut according to the weight required. The notched bars and alloy ingots are used for foundry purposes.

Types of Products

Other forms of aluminium include "Half-Round Sticks" for de-oxidizing iron and steel. The length of these sticks is usually 24 in., and the weight is, approximately, three-quarters of a pound. Sheets and plates are produced for manufacture into a great variety of articles. The term "Circle" designates a circular sheet as employed in the manufacture of cooking utensils. Aluminium is also manufactured in the form of matting, impressed with a pattern, for use as stair and running board treads. There are three well recognized patterns known as Fluted, Diamond, and Pyramid respectively.

Tubes and sections are manufactured on a large scale. Of the latter the leading company in Great Britain produces nearly a thousand standard types, while particular sections can always be specially made. Other forms in which aluminium is manufactured include rods, wire, and cable. The wire is largely used for transmitting electric power and for netting and gauze.

The term "Aluminium Scrap" covers a variety of forms of the metal. Scrap is produced, legitimately, as waste in metal rolling mills, sheet metal works, and foundries, and it is also found in the market in the form of faulty castings and reclaimed metal.

There is, in the case of ingots, an important distinction between virgin and remelted metal, the latter admitting of the incorporation of scrap of doubtful origin and purity, which may cause trouble in foundry work. When, however, the exact nature of scrap can be vouched for, there is a good market for the product.

XXXI.—INGOTS OF MAGNESIUM

There are points of similarity between aluminium and magnesium. Both metals are widely distributed over the surface of the earth as constituents of clay or rock, although, in each case, the particular type of ore from which the metals can be most easily extracted occurs in comparatively few centres. Both are malleable and ductile, and exceptionally light. In this last characteristic, however, magnesium has a distinct advantage over aluminium, for it is 40 per cent. lighter.

The production of magnesium in Great Britain dates back some sixty years, but it is an industry in which Germany has specialized and, in the face of German developments, the magnesium industry in the country was temporarily extinguished. Magnesium has important uses in warfare, and the outbreak of war found it without supplies. The admitted brilliance of the German star-shells and Verey lights during the Great War was partly attributable to the German predominance in the production of magnesium.

Owing to the urgent national demand two leading British firms together then set to work to manufacture magnesium once again. Works were established, and the British magnesium industry, as it exists to-day, owes its origin to that war-time effort. Germany during the war enormously increased her production of the metal with the idea, partly, of using it in place of aluminium and copper, of which her supplies were very inadequate.

Since the war Germany has been making further efforts to expand her magnesium industry, and to regain, if possible, the dominating position she previously held as the great producer of the metal for the world. Evidence of her activity in this direction has been provided by the great number of patents she has taken out.

PROCESS OF MANUFACTURE

There are ample supplies of the necessary raw material in Great Britain in the form of large deposits of dolomite, mainly in Derbyshire. The raw material is, however, chiefly brought from Greece in the shape of magnesite—*i.e.*, carbonate of magnesium. This carbonate is burned in a kiln similar to a lime-kiln, and is converted into magnesia, the oxide of magnesium.

Most processes for the manufacture of metallic magnesium consist, fundamentally, of the electrolysis of melted anhydrous magnesium chloride, which is obtained by treating the magnesia with chlorine gas. The gas is led through pipes into water with which finely divided magnesia is mixed. The magnesia and the chlorine combine to form magnesium chloride, which dissolves in the water. The solution is evaporated and the magnesium chloride is crystallized, the crystals being dried first in a current of hot air, and then in a current of hot hydrochloric acid gas. The dried crystals, known as anhydrous magnesium chloride, are melted in an electrolytic cell and an electric current is passed through them at a temperature above the melting point of magnesium. This current splits up the magnesium chloride into molten magnesium metal and chlorine gas, the former being ladled out and cast into ingots.

The Question of Price

Owing, mainly, to the present limitations of the industry in Great Britain, magnesium is now more costly than aluminium, but those who are engaged in its production are convinced that if magnesium were to be manufactured, like aluminium, on a large scale, the metal could be sold more cheaply.

Magnesium is, roughly, one-fifth the weight of steel and, in the form of rolled bars, has a tensile strength of about 20 tons per square inch, as compared with about 30 tons for mild steel. There are many directions in which a metal of the lightness and strength of magnesium could be of great service.

The metal, as manufactured in the process outlined, may be run into moulds of various shapes, notably ingots, notched bars, slabs, round bars, and small sticks. These forms are similar to those in which aluminium is marketed. Transactions in magnesium take place on the basis of a minimum purity of 99·5 per cent. of magnesium. The term "Ingots" represents large billets of circular or rectangular sections for rolling or forging. Sticks of small diameter are produced by extrusion.

Magnesium wire is also manufactured by the same process. Ingots are placed in a die pierced with a small hole of the size of the wire required. Through this hole the wire is forced by means of hydraulic pressure. Magnesium ribbon, largely used in photography for printing, is made by passing the wire between steel rollers. The ribbon, provided it is not more than 5-1,000ths of an inch thick, may be lighted with a match, but metal of greater thickness, as in the form of a casting, will not burn. Magnesium powder has an important use in flashlight photography.

The susceptibility of the metal to the action of salt has hitherto retarded its use in aviation. Experiments are, however, constantly being made with a view to discovering how this difficulty may be overcome. So much scientific effort is being expended in this matter that nothing practicable is likely to be left undone to secure a result which would at once have the effect of greatly increasing the uses of the metal.

XXXII.—ANTHRACITE, DRY, AND STEAM COAL

The terms employed in the coal industry are more numerous than those common in most trades, owing to the existence of special "languages" in the various coal-fields, to the wide discrepancies between the character of the coal won at the mines, and to the different methods of preparing the coal for the market by screening or otherwise. By "screening" is meant the passing of coal over and through screens in order to separate it into pieces of various sizes. There are thus various descriptions of "Screened Coal."

Really, no hard-and-fast line can be drawn between the numerous qualities and grades of coal, because these merge into each other. Coal is sometimes, however, classified, very broadly, into anthracite and bituminous. Incidentally, the latter term is a misnomer, since there is no bitumen in coal. Anthracite may be described as coal in which the proportion of fixed carbon is highest. It burns practically without flame and without smoke. The appearance it gives is that of "glowing," rather than of burning fiercely.

Bituminous coal may be described as that in which distillation begins at a comparatively low temperature and in which the proportion of fixed carbon is less than in anthracite.

In the United States a clear distinction is drawn by name between the anthracite and the bituminous coalfields, and the men engaged in mining these two descriptions of coal belong to different unions. When a strike has occurred in the anthracite fields private consumers have been affected, owing to the practice of burning anthracite in the stoves used for the central heating of buildings, which is usually adopted throughout the United States. On the other hand, when a cessation of work occurred in the bituminous coalfields it was industry that was mainly concerned.

Careful Sizing of Anthracite

With the exception of a relatively small, but regular, output of anthracite coal in a certain district of Scotland, practically all the anthracite coal mined in the United Kingdom comes from the counties of Glamorganshire (West), Carmarthenshire, and Pembrokeshire, and it is shipped, principally, from the ports of Swansea and Llanelly. The purposes for which anthracite is used demand that the coal shall be carefully " sized." All the collieries possess the necessary screening apparatus, while many of them are also equipped with " Breakers," the function of which is to break the large coal into the required sizes of " Nuts," which represent small pieces of coal.

Dry and Steam Coal

Between these two descriptions are the Semi-anthracite, or " Dry," and Steam types of coal. Semi-anthracite is produced in Glamorganshire, and is more brittle than true anthracite. Nevertheless, it has its uses, and, within recent years, considerable progress has been made in the way of screening it, in order to provide a substitute for anthracite. The coal is sold under the generic term of "Dry Coal," and can be obtained in the form of large coal, nuts, or beans. The nuts and beans vary considerably in size at the respective collieries, where the screening apparatus appears to have been regulated to meet the requirements of the customers.

The term "Steam" is used to describe coal which is particularly suitable for burning in marine steam boilers. It burns more readily than anthracite, gives out great heat, and produces little or no smoke. Obviously, all qualities of coal can be used for producing steam, and the suitability of one quality for this particular purpose is entirely a question of degree. The best South Wales steam coal was used for warships of high speed before the adoption of oil-firing. As another indication of its quality, it is commonly employed in the trials of new merchant ships when the maximum speed which the ships can attain is desired to be known.

Coal containing the largest amount of volatile hydrocarbons is known as "Gas Coal," owing to its suitability for the production of gas.

A Broad Classification

The character of coal mined in Great Britain and, indeed, throughout the world and its suitability for particular purposes are determined, largely, by the percentages of volatile hydrocarbons and oxygen contained in combination with the pure or fixed carbon. The latter represents the great bulk of the constituents of all types of coal. The proportion of volatile hydrocarbons and oxygen in leading descriptions of coal produced in Great Britain may be set out as follows:—

Anthracite	4 to 8	per cent.
Semi-anthracite, or dry coal	8 to 12	,,
Welsh steam coal	13 to 20	,,
Durham steam coking coal	24 to 28	,,
Durham gas coal	28 to 32	,,
Yorkshire steam, coking, and gas coal	30 to 38	,,
Midland house coal	38 to 45	,,

This classification is necessarily of a general character and is subject to the important qualification that the types often merge into each other; hence, as already pointed out, no definite demarcation can be drawn between the properties of many of the different qualities. For instance, "Durham Gas Coal" would give excellent results for steam-raising purposes, although these would not be equal to the results obtained from "Steam Coal" mined in the same district.

XXXIII.—LARGE, SMALL, AND NUT COAL

An account was given in the preceding chapter of distinctive qualities of principal types of coal, such as anthracite, semi-anthracite, dry, steam, and gas coal. Various descriptions of house coal are discussed later, the special feature of which is that while, like gas coal, it contains a comparatively large proportion of volatile hydrocarbons, it includes a larger proportion of oxygen than coal which is most suitable for the production of gas. There may now usefully be mentioned a number of the terms applied to the sizing of coal for industrial and export purposes, as set out in market reports.

One of the commonest distinctions is between "large" and "small" coal. The size of the pieces is dependent on the process of screening at the collieries and docks. In the case of anthracite in the market at Swansea, which is the chief British port for the export of this type of coal, the term large is applied to all sizes with a diameter of more than five inches. The terms applied to smaller sizes at Swansea may be shown as follows, together with the corresponding terms applied to the sizes in Scotland, which is the only other export centre in Great Britain for anthracite:—

Term in Swansea Market	*Size*	*Term in Scotland*
	Inches	
Screened cobbles	2½—5	Jumbos (cobbles)
Machine-made cobbles	2½—4	
French nuts	1½—2¾	Trebles
Paris nuts	1—2½	
Stove nuts	1—2	Doubles
Pea nuts	1—1¼	Singles
Beans	½—¾	
Peas	$\frac{3}{16}$—$\frac{5}{8}$	Pearls
Grains	½—¼	

The term "billyduff" (in Scotland, "gum") is applied to fine coal remaining after all pieces of the sizes enumerated have been screened from the main product. The term "breaker duff" signifies minute particles of clean coal formed in the crushing of larger pieces in the breaker referred to on page 117.

"Rubbly culm" is a term applied to coal passed through ordinary screens fitted with longitudinal bars 1¼ in. apart. "Culm" is applied to inferior qualities of the same size as rubbly culm. Culm is, as a rule, used for burning lime or for mixing with clay for domestic use locally.

Welsh Steam Coal Sizes

In the Welsh steam coal trade, which is quite distinct from the trade in anthracite, the term "screened" is commonly used in place of large. What is known as "Welsh steam coal" is mined on a large scale in Glamorganshire, and also in the English county of Monmouthshire. Chief terms used in this trade to

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designate sizes are "colliery screened"; "thro' and thro'"; cobbles (of which the production is small); and "colliery small."

The term "colliery screened" signifies coal which has been passed over a screen with spacings of, as a rule, 1¼ in. at the colliery, in the process of transfer from mine tub to railway waggon. As may be imagined, the term "colliery small" means all coal which is passed through the same screen. "Cobbles" represent the product of a separate and independent screening of the colliery screened coal, but coal of this size is produced at only a few collieries. The term "thro' and thro'" was for many years applied locally to unscreened coal, but it is now used very largely to describe a mixture consisting of colliery screened and colliery small coal in equal proportions.

Double-Screened Coal

In addition, the terms "double-screened coal" and "dock screenings" are occasionally used. The first term means coal which has been passed over two further screens at the dock to eliminate any small coal produced in the course of railway transport. A strict definition of such coal should therefore be "double screened at time of shipment." Such coal is referred to very occasionally as "thrice-screened coal," which, it will be seen, is also a strictly accurate term. Dock screenings represent the residue from such screening at the dock, and naturally such coal is very much purer than the small coal produced at the colliery.

Well-known grades of large coal quoted on the

Cardiff market include Best Admiralties, Second Admiralties, Best Drys, Other Drys, Black Veins, Western Valleys, and Eastern Valleys.

Grades of small coal at Cardiff include Coking Smalls, Best Steam Smalls, Good Bunkers, Ordinary Cargo Smalls, and Inferior Qualities. Further, from the small sizes are screened and washed various forms of "nut coal."

THE WASHING OF COAL

The object of washing coal is to separate by gravitation the small particles of shale which break away from the roofs and floors of the seams in the process of mining, in order to ensure greater purity in the primary product.

The chief descriptions of "bituminous coal" dealt in at South Wales include Best Households, Good Households, Household Cobbles, No. 3 Rhondda Large, No. 3 Smalls, No. 2 Rhondda Large, No. 3 Throughs, and No. 2 Smalls. These types of so-called bituminous coal are the product of seams lying much above the deep seams from which the steam coal is obtained, and although the production is considerable, it is far smaller than that from the deeper measures.

XXXIV.—TYPES OF HOUSE COAL

The Midlands and the North are the chief sources of supply in England of gas coal and house coal. To draw clear distinctions between the qualities of many of the grades of these is impracticable, and there must be variations in the qualities sold under the terms which are most familiar to householders.

One of the best-known terms in the retail trade is "Derby brights." It is very doubtful if such a term is generally used at any collieries. The term "Derby brights" is really used among retailers in London to signify coal, possessing a bright appearance and of an excellent type for burning in household grates, which is produced in the Midlands. Another well-known type is "Best Silkstone." One of the leading merchants was asked at an official coal inquiry what was meant by this term, and the reply was: "Best Silkstone is bought either from the Midlands or from Yorkshire, and, as the Midland pits are getting worked out, most of it comes from Yorkshire." Again, there were questions as to what was meant by "best coal," and a reply was that "Best coal is the best coal you can buy in the market."

YORKSHIRE AND MIDLAND COAL

In the wholesale market various terms are used to denominate the different seams in Yorkshire and the

Midlands from which coal is produced. Such terms include South Yorkshire hards, Derbyshire top hards, Derbyshire deep hards, Nottingham hards, Parkgate, and Hartleys.

It is in the Yorkshire and Midland districts that the sizing and washing of coal has been carried to the finest point. Some of the collieries in Yorkshire and the Midlands even sell "hand-picked" coal, which naturally commands a high price. The main divisions of the coal produced in these areas may be described as "sized coal," "steam slacks," "coking slacks," and "gas coal." Coal of these various main grades is again subdivided. Thus sized coal may be classified into various descriptions ranging from "washed smithy peas" of from ½ in. to ⅝ in. in diameter, through dry and washed singles, doubles, and trebles, to cobbles of from 4 in. to 6 in. in diameter. Then, under the main heading of steam slacks, there are "rough," "nutty," "fine," and "washed," varying from ¼ in. to 2 in. in diameter. Under coking slacks there are washed and dry ranging from 1¼ in. to 2½ in. Principal types of gas coal are South Yorkshire (chiefly from the Parkgate seam), West Yorkshire, and Derbyshire. Large sums of money have been spent in recent years in providing the most modern form of washing plant.

CHARACTER OF DURHAM COAL

Going farther north, a distinct difference is noticeable in the method of preparation adopted in the Durham colliery district, for there screening appliances are very little used. This is due to the facts that Durham coal is decidedly friable in character and, even if screened, small coal is created in transit and shipment; that comparatively little extraneous matter breaks away in the course of mining, owing to the extreme hardness of the roofs and floors of the seams; and that the coal possesses a high coking power, so that the small pieces will form their own lumps on the fire and produce equal efficiency to the original "lump coal." In a few collieries, however, where conditions are exceptional, screened coal and even nut coal are produced, while certain collieries sell coal under the term of "partially screened," which means that some of the small coal has been taken from the bulk for the purposes of the colliery boilers and also for the coke ovens. The principal designations given to Durham coal are the following:— Best Durham steam, second-class steam, smithies, gas specials, gas best, gas seconds, and coking coal (unscreened or small).

Market Terms

In Northumberland the character of the coal mined is entirely different from that produced in Durham. Coking power is deficient, but, on the other hand, the coal is much harder and can be, and is, screened to commercial advantage. Certain of the seams produce a house coal of excellent quality. Market quotations are generally given under the following headings:— Best Blyth screened steam, Blyth second steam, best Blyth small, second Blyth small, best Tyne screened steam, Tyne second steam, best Tyne small, and Tyne second small.

Reference was made in the last chapter to the terms applied to anthracite mined north of the Tweed. The usual practice, in the case of Scottish "steam" and "domestic" coal, is to pass the coal, as produced from the mines, over screens with spaces of about 2 in. apart. Such coal as passes over the screens is sold as "screened coal"; that which passes through the screen is sold under the general term of "dross"; and that which is passed through a washing and sizing plant is sold as "trebles," "doubles," "singles," "pearls," or "gum." Coal which is not passed over the screens is sold as "unscreened" or "triping," the latter term being peculiar to Scotland.

NAVIGATIONS

Other terms which are solely applied to Scottish coal include "splint," signifying steam coal, of which there are various grades; and "ell," a term applied to household coal, of which there are also considerable variations. An exceptional grade of steam coal of comparatively low volatile character is produced in Stirlingshire, and also, to some extent, in Fifeshire. These grades of coal are generally sold under the designation of "navigations." They are mainly used for ships' bunkers, but they are also excellent for all steam-raising purposes.

XXXV.—MINERAL OILS AND SPIRITS

Mineral oils represent one of the three main divisions into which oils may be classed. The products included in the term "mineral oil" are numerous. All have their origin in the crude oil obtained from wells in various parts of the world. This crude oil, black or brown in appearance, is a more or less viscous liquid. Sometimes it is found in a state so nearly solid that pumping is difficult, while in other cases it is perfectly liquid. All the various oils which are obtained from the raw material are the products of processes of distillation, the particular commodity secured varying according to the temperature applied to the stills, and also according to the nature of the original oil.

Petrol and Kerosene

As a rule, the first products to be distilled from the crude oil are light volatile oils, which are then refined by various chemical processes. These refined oils are known in different countries by different names. In Great Britain they are usually known as "petrol" or by the generic term of "motor spirit." In the United States the term used for this product is "gasoline" or simply "gas"; in France it is described as "essence"; and in Holland and Germany the term "benzine" is used. This last term should not be confused with "benzene" or "benzol," which is normally a product obtained by the distillation of coal.

After petrol the next product to be removed by distillation is what is known as "kerosene" or "paraffin oil." This product, after further purification, is used for burning in oil lamps and stoves, and also in certain types of internal-combustion engines.

Diesel Oil and Lubricating Oil

After the kerosene has been distilled off, the next product to be removed is gas oil. This gas oil is chiefly used as a fuel in the motor engines named after Dr. R. Diesel, and so it is commonly termed Diesel oil. Gas oil of this type can also be used as fuel in so-called semi-Diesel engines, which are usually rather smaller than the true Diesel type.

At a further stage of distillation lubricating oil of all descriptions is obtained, ranging from the thinnest oil used for watches, typewriters, and sewing machines to the heaviest oil for the lubrication of large machinery. All these lubricating oils have, of course, after distillation, to be purified carefully before they are put on the market.

Fuel Oil or Bunker Oil

After the products named have been driven off, a residue usually remains in the still, which is sold as fuel oil, or bunker oil, for steam-raising purposes. The bulk of this fuel is obtained from heavy types of crude oil, which often contain only very small amounts of the lighter products. Certain types of fuel oil are so free from objectionable constituents that they may be used as fuel in Diesel engines in the same way as gas oil.

Asphalt and Paraffin Wax

Certain crude oils contain very large percentages of bitumen, commonly called "asphalt." This product is obtained by carrying the distillation process still further and thus removing the whole of the volatile portion of the oil, the asphalt being left behind in the stills at a temperature at which it is liquid and can be pumped away to the cooling tanks. Various grades of asphalt are made, which are used in large quantities for road-making and for the manufacture of such articles as roofing felt and bitumastic paint.

There are other crude oils containing large percentages of paraffin wax, which is obtained by chilling the oil driven off after the petrol and kerosene have been removed. On cooling the wax crystallizes and can be removed and purified. It is finally obtained as a pure white product used in the manufacture of candles, matches, boot and furniture polish, wax papers, and so on.

Vaseline and Medicinal Oils

Various other products are also manufactured from mineral oil, such as those well-known household articles—vaseline and medicinal paraffin. Batching oil, which is used largely in the jute industry, consists of a very thin form of lubricating oil, the function of which is to moisten the jute and render it pliable for spinning. Hair oil and various types of ointment also frequently contain large proportions of mineral oil, and other products of crude oil are used in the treatment of leather and fur.

The light volatile oils mentioned above may also be split by further distillation into different grades of petrol, which are employed in dry-cleaning processes in the rubber industry, and as a substitute for turpentine under the name of "white spirit."

Oil is usually sold wholesale by the ton weight, although in the United States the lighter oils are sold by the gallon and fuel oil by the barrel. The term "naked," on which oil is sometimes sold, means that the buyers take delivery at the ports or refineries, and themselves provide the "containers" or covering. If the oil is not sold naked the sellers provide the containers.

Construction of Tankers

Ships, often referred to as "tankers," are specially designed to carry mineral oil, the difference between their construction and that of general cargo vessels being that the engines and boilers of tankers are placed at the after end of the ship, and are kept separate from the inflammable cargo by coffer-dams filled with water, an arrangement which much reduces the risk of fire.

TEXTILES AND FIBRES

XXXVI.—COTTON STANDARDS

Until the beginning of August, 1924, all dealings in both "spot cotton" and "cotton futures" in Great Britain took place on the basis of the Liverpool standards. Of these there were, for American cotton alone, ten "grades." The grading of cotton depends on its brightness and colour, and on the amount of leaf and dirt associated with it. The length and quality of the fibre also govern the value.

The most representative of the grades of American cotton was "fully middling," and all dealings in futures were on the basis of delivery of this grade. The American futures contract provided for allowances for quality superior, or inferior, to, fully middling, and the other grades that might be tendered were mid. fair, fully good middling, good middling, middling, fully low middling, and low middling. The Liverpool standards were originally made up by the American Appeal Committee of the Liverpool Cotton Association, and have always been kept inviolate by them.

Samples of the various grades, representing the standards, have been carefully preserved in small wooden boxes. When cotton is tendered on contracts for futures, arbitrations are held in the rooms of the Liverpool Cotton Association. The arbitration rooms are situated on the top floor of the Exchange, and are well lighted. The practice is for samples to be drawn from each bale tendered, 100 bales being the smallest quantity of cotton for which a futures contract is made. Members of the association, acting as arbitrators, then examine the samples drawn from the bales to be delivered, and compare them with the cotton in the standard boxes, being careful to lift the lid from the "cotton standards" for only a very short space of time in order to avoid, as much as possible, discoloration of the standard by the air and dirt. The awards of the arbitrators are subject to the right of appeal to the American Appeal Committee.

Length and Quality of Fibres

In valuing the cotton which has been tendered, the practice of the arbitrators is to draw the fibres apart, so that they can tell to a nicety, by a practised eye and light touch, the exact length and quality of the fibres. The average length of American cotton is from about 1 in. to 1⅛ in., but to such a fine point has the exact measurement of the fibres been carried that there are actually four recognized lengths of cotton measuring about 1⅛ in. long. There is a "shy 1⅛ in."; "1⅛ in."; a "good 1⅛ in."; and a "full 1⅛ in." So delicate is the spinning machinery of the Lancashire mills that the most minute difference in length of fibre may render cotton unsuitable for particular mills. The machinery in some mills is designed for fibre of a special length, and the equipment of other mills, likewise, to fibres of slightly different lengths. Strong fibre which measures from 1 $\frac{3}{16}$ to 1$\frac{5}{8}$ in. is worth substantially more per pound than fibre measuring 1$\frac{1}{8}$ in.

The Universal Standard Scheme

In 1923 the Liverpool Cotton Association undertook with the United States Government to adopt, in place of its own standards, the agreed American standards, which were to be known also as "Universal Standards." These standards came into actual use in Liverpool on August 1st, 1924, but towards the end of the experimental period of the previous twelve months considerable difficulty arose, owing to the inability of the Department of Agriculture at Washington to provide exact copies of the original standards for arbitration purposes. This question was discussed with representatives from Washington at a European conference, and a scheme to issue efficient working copies was drawn up as a Supplementary Agreement. In accordance with this arrangement, European representatives went to Washington in June, 1924, to pass, and agree upon, key sets for the European exchanges. The Department of Agriculture then declined to sign this agreement, and eventually offered proposals of its own which were to form a supplementary agreement to the original one. It was decided, however, by the members of the Liverpool Cotton Association that these proposals were not acceptable.

Early in 1925 further negotiations were entered into between the Liverpool Cotton Association and the Department of Agriculture at Washington, which resulted in another delegation to Washington in the following March. The foundation was then laid for a full conference to be held in London between the Department and representatives of the European Exchanges. This took place in May, 1925, when certain alterations in the original agreement were approved to ensure the perfect legality of the conditions, and a number of suggestions which had been advanced by the Liverpool Cotton Association in the Supplementary Agreement were adopted.

In consequence of this conference the Liverpool Association cancelled its notice to withdraw from the Original Agreement and re-entered the scheme and adopted, together with all other Exchanges, the Universal Standards for American cotton in respect of grade and colour. One important alteration was that copies of the Universal Standards will now be prepared and issued by the Department, subject to the approval of the European Exchanges every two years, instead of every year, as was originally suggested. The new Supplementary Agreement also provides for certain safeguards to ensure that the standards issued will be exact copies of the original Universal Standards.

Preservation of Many Standards

There are many standards other than those for American cotton, and every growth of any quantity has its own particular standard boxes. East Indian cotton is represented very fully in this way, for there are more than a dozen descriptions for which quotations are issued, and these quotations, which are for the various grades of each description, are based on standards.

XXXVII.—"SPOT COTTON" AND "COTTON FUTURES"

Dealings in cotton in Great Britain may be divided, broadly, into those in "spot cotton" and "cotton futures." Transactions in spot cotton take place at Liverpool either in the Cotton Exchange or in the offices of the brokers surrounding the Exchange itself, and at Manchester. Very large stocks of cotton are held at Liverpool. In a brochure prepared for the British Empire Exhibition, Mr. A. C. Nickson, the secretary of the Liverpool Cotton Association, stated that in the year 1911-12, during which 5,000,000 bales were imported into Great Britain, the stock of cotton held at Liverpool amounted, at one time to 1,368,000 bales out of a total of 1,475,000 bales. In 1923, out of a total of 2,462,000 bales of cotton imported into the country, Liverpool handled 2,065,000 bales, and the value of stock in Liverpool at any one time is stated to vary between £20,000,000 and £30,000,000.

By the term "spot cotton" is meant actual cotton which is in warehouse and ready for immediate delivery.

Actual raw cotton may be sold either on the basis of Spot Terms ex warehouse, Deferred Delivery on Spot Terms, or on C.I.F. and 6 per cent. Terms. The provision of "6 per cent." means that the seller is allowed to deliver the specified weight of cotton contracted for, less 6 per cent., payment being made for the reduced quantity. The allowance is made for the purpose of covering tare, weight of bands, etc. It is intended to represent the difference between the method of selling cotton in the United States and the method of buying it in this country. In the United States cotton is sold in bales of gross weight, whereas in Liverpool the actual net weight is bought.

Spot Terms and Deferred Delivery

The rules of the Liverpool Cotton Association applicable to what are known as "spot terms" also make provision for certain allowances to be made for canvas, bands, double draught, etc. The full weight of the cotton is calculated and the allowances must be deducted in the invoice, and payment be made in cash within ten days.

When cotton is sold for "deferred delivery" the cotton must be delivered during the month or months named in the contract, and it must equal in all respects the type or description of the cotton on the basis of which it has been sold. If the outturn is not equal to the sample or description the seller has the option of making a second tender, and should any bales be then judged to be not equal to the type or description the buyer has the right to invoice them back to the seller at the current price.

The buying and selling of spot cotton usually take place in quiet conditions compared with the excitement which often rules in the futures market. The only futures cotton markets of importance in Great Britain are on the floor of the Liverpool Cotton Exchange.

ACTIVE DEALINGS IN FUTURES

The futures markets are centred in " Rings " around which the dealers congregate, and, at busy times, such as 3 p.m., when the opening American prices are received by telegram and price movements in the United States have been important, the scene is an animated one. The hour of 3 p.m. in Liverpool corresponds with 10 a.m. in New York, when the exchange there opens. The opening prices at the New Orleans Exchange are received almost immediately afterwards. Just before 3 p.m. at Liverpool members will pour into the Exchange and by the moment when, on the ringing of a warning bell, the opening American prices are chalked up on a large blackboard, there may be some hundreds of dealers present ready to buy and sell.

When price movements have been wide, dealings may be accompanied by a good deal of shouting, as individual members try to make their bids, or offers, heard above the din, and when this becomes very loud the centre of the ring is occupied by an official, who telephones to an official at the board on which the transactions are recorded a few yards away the actual prices at which the transactions take place. These are then recorded on the blackboard, alongside which are also chalked price movements of one-hundredths of a cent per lb. in the prices of the New York and New Orleans Exchanges, as these are received by cablegrams every few minutes. Prices are also at once reported to Manchester, where they are recorded on the Royal Exchange, for the prices of futures govern the prices of spot cotton, and directly affect prices of yarn.

As from the beginning of September, 1925, a new "ring" or "pit" has been used on the Liverpool Cotton Exchange for dealings in Empire or miscellaneous futures contracts. Against these contracts all growths not lower than that of Strict Low Middling American cotton may be tendered, with the exception of grades of Egyptian cotton tenderable under the Egyptian futures contract.

Speculative and Ordinary Trading

Obviously the market in futures can be used for speculative purposes, as well as for ordinary trading. All dealings in contracts for American cotton futures take place on the basis of 100 bales of cotton, each of which weighs 480 lb., and price fluctuations are based on pence and hundredths of a penny per lb. In normal markets it is possible to deal within one-hundredths of a penny per lb. All futures contracts are now based on the "Universal Middling Standard," which is intended to represent the average grade of the average American crop, and is equivalent to the old "Liverpool Fully Middling." Dealings in futures are recognized for twelve individual months ahead of the month during which they take place, so that transactions may extend for thirteen months.

XXXVIII.—HEDGING IN THE COTTON FUTURES MARKET

Reference was made in the last chapter to dealings in "Cotton Futures," and the account given of these may now be supplemented with a description of the purposes for which dealings in futures are employed.

These objects have been clearly described in detail by Mr. A. Bryce Muir, a late president of the Liverpool Cotton Association, both in a paper read at the Textile Conference in June, 1924, in connection with the British Empire Exhibition, and in an interesting pamphlet on "Cotton Futures" prepared for private circulation. Mr. Bryce Muir shows how a spinner wishing to buy a given quantity of cotton per week for three months ahead against a sale of yarn over a similar period can, on fixing the price of his yarn, buy an equal weight of cotton for future delivery in the months in which he requires it. He is thus independent of any fluctuation in price, for he has based the price of his yarn on the price at which he could buy his cotton for future delivery. As each month comes round he can sell his future delivery contract and simultaneously buy the particular quality of raw cotton he needs, basing his purchase on the price at which he sells his futures contract. Should prices have, meanwhile, advanced, he pays the higher price for his quality of raw cotton, but as the value of his futures contract has also risen, the profit he makes on this goes to reduce the increased amount he pays for his raw cotton.

Similarly, should prices decline, the spinner buys his raw cotton at a correspondingly lower price, but he has to set against this saving in price the loss incurred by his purchase of futures at a higher price. Therefore, as long as he converts his futures contract into a contract for an equivalent weight of the particular quality of the raw cotton he requires, at the price ruling at the time, he is able to eliminate intermediate fluctuations.

Protection against Price Movements

In the same way, merchants who import cotton "hedge," or protect themselves against fluctuations in price, by selling an equivalent weight of futures when they purchase the raw cotton, re-purchasing the futures contracts as and when they sell the cotton imported; and where they have sold cotton for forward delivery at a fixed price, buying futures against the sales, they sell out their futures contracts when they obtain the particular cotton they need. One great object of the futures market is the provision of a means for the prevention of ill-effects to traders of fluctuations in prices.

By the term "Docket" is meant the tender of, approximately, 100 bales of cotton by the first seller to the last buyer in fulfilment of a futures contract.

A far smaller futures market exists in Egyptian cotton than in American cotton. A bale of Egyptian cotton contains 720 lb., as compared with an American bale of

480 lb. The basis of the Egyptian futures contracts is termed " Fully Good Fair Sakellaridis." Including that in Empire and miscellaneous cotton, there are thus three futures markets on the Liverpool Exchange.

The term " Outside Growths " signifies cotton grown in countries other than the United States or Egypt. Thus included in outside growths are the important Indian descriptions, of which the best known are Broach, Tinnivelli, Scinde, Oomra, and Bengal, together with cotton grown in the British Empire and Brazil, Peru, Mexico, China, etc.

The term " Linters " signifies the short fibres scraped from the cottonseed, after ginning, and before the seed is crushed at the oil mills.

The phrase " False Packed Cotton " means a bale which contains two different qualities of cotton. Normally each individual bale is made up of only one precise quality.

STRADDLES AND REVERSE STRADDLES

" Straddles " represent dealings by operators based on the relative values of the New York, New Orleans, and Liverpool futures markets. The object is to take advantage of the comparatively higher or lower prices which may be ruling in one or other of these markets, and into such transactions the parity between the exchanges naturally enters. Straddles come under the generic term of Arbitrage business. To " buy one period " and sell another " period " in Liverpool is generally termed a " swap."

Sometimes reference is made in market reports to

"Reverse Straddling Operations." These represent merely a closing of the original straddle entered into. Thus the operation of buying July delivery in Liverpool and selling July delivery in New York is a straddle. To sell July in Liverpool and to buy a similar delivery in New York would be a reverse straddling operation.

Visible and Invisible Supplies

Usually down to the end of July of each year all dealings in American cotton are on the basis of the last crop. Towards the end of August the first supplies, as a rule, of the new crop begin to be delivered.

In order to assist its members the Liverpool Cotton Association issues, weekly, a large number of statistics. These include details of the "Visible Supply," consisting of stocks in Great Britain, in the United States, and in other producing countries, and also afloat. The "Invisible Supply" consists of such items as mill stocks throughout the world, stocks on the plantations, etc. Particulars are given of "Spinners' Takings" throughout the world for both the week and for the period since August 1st. The term spinners' takings means cotton actually delivered to the mills for either immediate or future consumption.

Forms of contracts applicable to the different methods of dealing in "Spot Cotton" and "Cotton Futures" are also issued by the Association.

XXXIX.—COUNTS OF COTTON YARN

A DESCRIPTION has now been given of the way in which the Lancashire cotton-spinner has acquired his raw material, which will have been drawn to Liverpool, by the powerful magnet of the large market there, from the United States and Egypt, and many other parts of the world, including British Dominions in which, to an increasing extent, cotton is now being cultivated. An account has also been given of the manner in which, by means of dealings in futures, the spinner is able to protect himself against the ill-effects of sharp movements in prices.

The scene now changes to Manchester, where, in the Royal Exchange, there is centred the market in yarns which have been spun from the raw cotton in one or other of the fifty important spinning centres of Lancashire. There is an important market in yarns which the manufacturer will buy to weave into one of the various types of cotton cloth for which he is famous throughout the world.

THE HANK AS THE UNIT

The spinning industry may be divided into two main sections, one concentrating on American cotton and the other on raw material from Egypt and other producing countries. The unit in which yarn is sold is, however, the same in the case of yarn spun from any type of cotton. It expresses a fixed relation of length to weight. It is the " Hank," which measures 840 yards, and so compares with the hank of 560 yards, which is the unit in the wool trade. As in the wool industry, a system of " counts " obtains in the cotton trade, the basis being that No. 1 Count, or, as it is commonly termed " No. 1's," consists of 840 yards, weighing 1 lb. avoirdupois. The number of grains, troy weight, in 1 lb. avoirdupois, is 7,000, so that if a hank of yarn is weighed in grains, and the weight divided into 7,000, the resulting figure will be the number of counts.

Yarn, of which two hanks of 840 yards each weigh together 1 lb., would thus be known as " No. 2's." The term " No. 20's " would mean that one hank of yarn of that count weighs $\frac{1}{20}$ of a lb., or that twenty times 840 yards, making 16,800 yards, weigh 1 lb. A representative number sold in drapers' shops, for which housewives ask in the form of a reel of cotton, is " No. 40's." If this count of yarn were bought by the pound weight the number of yards of cotton acquired in 1 lb. would be 33,600 yards.

In France the basis is also No. 1 Count, 1,000 metres of which weigh 500 grammes. The same length weighing 250 grammes qualifies for "No. 2's," and the same length weighing only 50 grammes would be " No. 10's."

Meaning of the Term " Twist "

" Twist " may be defined, primarily, as the product of the twisting together of two or more single yarns. In this way, if two threads of, say, " 20's " counts are twisted together in order to make one thread, the latter would be termed twofold 20's, or "2/20's." Three threads twisted together would be termed threefold 20's, or "3/20's."

A twofold 20's would be the equivalent of "10's" single. That is to say, 8,400 yards of 2/20's would weigh 1 lb., but it would never be referred to as "10's," since it is a different and stronger yarn.

Actually the term twist is used in at least two distinct forms. It signifies, first, as described above, the product of the doubling or trebling, or further increasing, the number of single threads to form one piece of yarn, and it is used as an alternative to "warp." Twist or warp yarns compare with "weft" yarns. In the United States the corresponding terms are "filler" or "filling" yarns. Weft yarns are spun in the opposite direction to warp or twist yarns, and the twist needs to be stronger. In the manufacture, however, of special kinds of cloth yarn spun twist-way is used for weft. The less twist there is the fuller the yarn, and the greater the diameter for the given weight.

Sometimes warp yarns are made into what are known as "chain" warps, as some dyers prefer them to be made in this way to facilitate the dyeing process.

Methods of Packing Yarns

When yarns are to be marketed they are packed in one of a number of different ways. A common form is that of "long bundles," each containing 10 lb. of hanks varying in number according to the count. Sometimes the bundles weigh only 5 lb. Another well-known form of marketing the yarn is in that of "pressed" bundles, which also generally contain 10 lb., and are especially used in the case of shipments to the East. Yarn so packed is wrapped in paper and the whole pressed in order to occupy the minimum space in course of transit and to prevent, as far as possible, damage. Other recognized forms in which yarn is marketed include "crossballs," "pirns," and "small cheeses."

Yarn to be packed in crossballs is sent to be dyed, bleached, or sized, and the manufacturer puts it on a beam to be woven into cloth.

Pirns and Small Cheeses

A "pirn" signifies a wood or paper tube on which the yarn is wound. The yarn wound in this way is generally used as the weft. "Small cheeses" are about 4½ in. wide and about 5 in. in diameter and are put into a warper's creel to make a warp—perhaps 400 or more, according to the number of ends in the warp. There are also cones of yarn which represent a form of "cheese," but are conical-shaped. These are mostly used in the Nottingham trade. The forms in which the yarn is packed varies, of course, according to the particular market for which it is intended.

XL.—NAMES OF COTTON MANUFACTURES

The Board of Trade returns, under the heading of "Cotton Manufactures," enumerate: "Grey, unbleached"; "White, bleached"; "Printed," "Dyed in the piece"; and "Manufactured wholly or in part of Dyed Yarn and commonly known as Coloured Cottons."

Grey and Bleached States

By the term "Grey, unbleached" are meant unbleached goods as delivered by the manufacturer to the warehouseman, bleacher, or finisher. The term "White, bleached" really explains itself, as meaning cloth which has been bleached. Sometimes the term "Bleached Shirting" is used, which signifies fancy shirtings, with pinstripes of super-dyed yarns to withstand bleaching. Principal descriptions for bleaching are known as zephyr shirtings and Oxford, Harvard, and Tennis shirtings.

By the term "Printed" or "Printers" are meant plain woven cloths used for printing and made from pure yarns of good quality and well woven. The cheaper descriptions of such cloths are made in the Burnley district, and the better-class descriptions in Cheshire. The usual yarns from which printers are made are from 32's to 38's twist, and from 30's to 54's weft.

"Dhooties," in which a large trade is conducted, signify a grey fabric with fancy edges used by Hindus as a loin cloth. Dhooties are shipped in large quantities to India. The ground colour is usually light and self-coloured, with a coloured heading; sometimes a coloured stripe is inserted in the centre. Dhooties are made in lengths of about 40 yards and cut up into lengths of from 5 to 18 yards, in accordance with the length of garment required.

"Mulls" may be described as plain-weave fabric woven from very fine yarn, with a very soft finish and free from stiffening. They are shipped, bleached, largely to India and the Far East, and are also exported in the grey state. The term "Jacconets" signifies a hard finished grey cloth of the weight of Victoria lawn and having a smooth lustrous finish like cambric. Jacconets are exported either in the grey state or bleached.

"T" Cloths and Mexicans

A term commonly used in the trade in cotton manufactures is "T Cloth," which derives its name from the marking of such goods by the first shipper with the letter "T." The term signifies a plain grey cloth of low quality and made from heavily sized yarns, and marketed, always, in lengths of 24 yards. The weight is from 4 lb. to 7 lb. T cloths are shipped largely to the Straits Settlements, India, China, Japan, and South America.

"Mexican" signifies a plain grey cloth of the shirting class, somewhat similar to T cloth. It can usually be distinguished by the heading, which generally consists of five red bars. Coloured Mexicans are, however, made with headings of five blue bars. They are also manufactured from finer yarns, and then have a blue ground and a small amount of white for stripes and are given a heading of five white bars. The name is said to have originated in the fact that, at first, the goods were largely manufactured for Mexico.

Fancy Cotton Manufactures

The term "Fancies" may be applied to any cloths which are not "staples"—*i.e.*, plain grey or plain white goods. Fancies mostly have a figured pattern woven in the grey, and are made on either a dobby or a jacquard loom. The term includes all cloths that are given special finishings, as by mercerizing, and also Union fabrics, which are made of wool and cotton and cotton and artificial silk, etc. The term "Finishing Styles" is used to signify all cloths made in plain or fancy weaves which are designed to undergo finishing processes. These processes, such as Swissing, embossing, and beetling, have the effect of giving a distinctive face to the cloth. Mercerizing is a recognized process for adding lustre to a cotton fabric, and there are various other ways of finishing special cloths.

Poplins, Taffetas, and Voiles

By the term "Poplins" are indicated plain woven fabrics originally made with a fine silk warp and comparatively "thick-gassed" worsted weft, which produces a fine corded effect. They are now made from cotton warp and cotton or worsted weft. Poplins made from finer wefts, in which the rib is not very well defined, are occasionally called "Taffetas." "Voiles" indicate a soft, transparent dress material plain woven from cotton or wool yarns. They are woven from fine, polished, and tightly twisted yarns, which give the finished cloth a distinctive watered appearance. Voiles are shipped in especially large quantities to South America.

Chintz and Cretonne

The term "Chintz" is applied to a printed cotton cloth, the characteristic features of which are the bright and gaily coloured patterns of flowers, geometrical designs, etc., printed upon it. It is woven with dyed yarn, is printed on the beam, and made with grey weft. By the term "Cretonne" is meant a printed cotton material which, like chintz, is used for upholstery, curtains, and other household purposes. In its manufacture waste weft of an uneven twill, satin, and oatmeal weaves are used. What are known as "Shadow Cretonnes" are manufactured by printing the warps before weaving, which gives the appearance of a somewhat vague design to the finished goods.

The term "Calicoes," used chiefly in the home trade, designates practically any plain cotton cloth coarser than muslin, and is made for use in both the grey and unbleached states.

NORWICH PUBLIC LIBRARIES

XLI.—MANCHESTER GOODS

The term "Manchester Goods" suggests some of the manufactures of the United Kingdom of the highest class. As an illustration of its meaning, large liners have been lost while outward bound to the East, and the mere fact that they had sailed from Liverpool or Manchester was sufficient to convey to marine underwriters the impression that the insurance interests would be very considerable and, likewise, that the possible loss might be very heavy. When vessels have been totally wrecked attempts have been made to estimate, roughly, the loss on the basis that the vessel would be carrying, approximately, so many tons of Manchester Goods, worth a round figure of so much a ton, which would mean a ton measurement of 40 cubic feet. The estimate of value per ton would necessarily be a rough one and would depend, to some extent, on the current values, but, in any case, a shipment of Manchester Goods would represent practically the most costly shipment that could be made of British manufactures.

An Authoritative Interpretation

Special rates for the insurance of Manchester Goods are made by underwriters. The assumption is that the goods will be carefully packed in cases or in bales, and in the latter case they are packed, nearly always, under hydraulic pressure. The question of precisely what manufactures are covered by the term Manchester Goods has arisen from time to time, and the following definitions are known to have been authoritatively considered and to have been found not altogether adequate:—(1) Piece goods or yarn composed wholly or in part of cotton; (2) Textile and other goods in the drapery and allied trades as supplied by the Manchester home trade warehouses; and (3) the goods of wholesale drapers and milliners. There is, however, high authority for giving the correct interpretation of Manchester Goods as being "All textiles or piece goods composed wholly or chiefly of cotton." The question then arises as to whether yarns should be included in the term. One or two well-known firms maintain that they should be included, but, again, there is reason for writing that, in the opinion of representative manufacturers, shippers, and underwriters, the word "yarn" should not be included in the definition. The contention of these interests is that the word "goods" means a finished product, and yarn is not a finished manufacture.

The Question of Yarn

At the same time, some underwriters, at any rate, would, it is known, have no objection, if specially informed of the shipment, to insuring yarn on the same terms as the finished products. Yarn has even a merit of its own, from the insurance point of view, in that it is not subject to the same amount of pilferage as the manufactured articles. Thus, while handkerchiefs are a finished product and, if made of cotton, are clearly entitled to fall within the manufacturing definition of Manchester Goods, underwriters expect them to be declared separately, because the risk of theft in their case is especially heavy. Owing to this risk, additional rates for insurance are quoted, particularly when the handkerchiefs are cut ready for use. When they are forwarded in long strips the risk of pilferage is not so great.

DOMESTICS

The term "Domestics" is well recognized in North American trade. The term covers all textiles used in the home, such as zephyrs, ginghams, white goods generally, and household goods. Considerable shipments are made of domestics from the United States, and underwriters quote special rates of insurance for them.

The term "Manchester Domestics" is, however, specially applied to heavily sized grey cloth sold in the loom state. The cloth is heavily weighted and is specially marketed in the Far Eastern trades.

"Dry Goods" is a phrase largely employed in North America. It includes all sorts of materials that are produced by textile machinery, such as drapery, carpets, and silk and woollen goods. It does not generally include such articles as hardware, jewellery, furniture, or groceries.

The term "Soft Goods" has a wider application than that of Manchester Goods. It may be defined as meaning "all descriptions of cotton and woollen textiles, linen goods, drapery, and the like." The term is, in fact, the antithesis of "hardware."

XLII.—VARIETIES OF SHEEP'S WOOL

The wool trade is rich in special terms in common use, which is natural enough in view of the number of countries in which sheep's wool is produced and the varying qualities of the wool obtained from the different parts of the animal.

Wool may be classified into three main divisions—fine, medium, and coarse. Fine wool is given by merino sheep; medium wool by Colonial cross-breds, English sheep, and other flocks that are well cared for; and coarse wool by native sheep to be found in North Africa and Asia, although some of the wool from the East is of a fine description and commands a high price. The main descriptions are again sub-divided into various grades.

Merino sheep are bred especially for the quality of the fleeces. All the well-known merino flocks can trace their ancestry to the Spanish merino sheep. In 1765 Spanish merino sheep were imported into Saxony, and to-day some of the finest wool in the world is Silesian merino. At about the same time George III. introduced Spanish merino sheep into England, and when the flock was disposed of Captain Macarthur bought eight of the sheep and sent them to Botany Bay, south of Sydney, New South Wales, and laid the foundation of the vast sheep industry in Australia. Although the breeding of sheep in various parts of the world, including the United Kingdom, dates back to the dim past, the debt of the world to Spain for the original merino sheep is considerable.

MEDIUM DESCRIPTIONS

Wool from nearly all British sheep may be included in the classification of "medium," while the quality varies from the finest "down" wool to coarse mountain wool. Some of the best-known flocks are those of Shropshire, Suffolk, Oxford, Hampshire, and all the Downs. A different type known as "Demi-Lustre" is clipped from Cotswold, Romney Marsh, Roscommon, Devon, and Wensleydale sheep, and a "Lustre Wool" or "Long Wool" from Lincoln and Leicester flocks. Special varieties of wool are clipped from the Cheviot, Blackfaced, Welsh, and Shetland flocks. Besides these are the "Half-Breds," of which the best is generally regarded as being the Border Leicester, a cross between the Leicester and Cheviot.

Cross-bred sheep are bred largely with a view to the value of the meat as well as that of the wool. With many of the cross-bred flocks the value of the carcass is known to be the chief consideration, to the detriment of the fleece, but owing to the increased value of wool flock-masters are now paying greater attention to its improvement.

VARYING QUALITIES

The varieties of wool, as they are known in the markets of Europe, are enormous, for not only does the wool vary in the different flocks, but it also varies according to the particular part of the sheep from which it is clipped. In the case of merino sheep the finest description is found across the shoulders; the back and sides yield a slightly lower quality; and shorter pieces are grown round the belly. In Colonial cross-breds the finest part of the fleece is again on the shoulders; the neck, sides, and saddle rank next; the back part produces a lower quality; and finally the britch. The English fleece yields a still larger number of qualities. As in the case of the other flocks, the shoulders come first; then the neck; then the middle of the sides and back; then the haunches and belly; and, finally, the hind legs.

At large stations overseas the fleeces are clipped round, or "skirted," and the different qualities and lengths are thrown into separate bins. Then they are pressed and baled and made ready to be sent to the nearest centre for sale, or to be shipped abroad. English wool is generally sold at the local fairs and country sales and, as a rule, it is sold by the pound. Old customs still prevail, however, in some counties, and wool is sometimes sold by the stone (14 lb.), the "tod" (28 lb.), or the "pack" (240 lb.). In Scotland a wool stone represents 24 lb. English farmers are now known to be finding that, by co-operation and the dispatch of their wool to a "classer," by whom it is graded and baled and sent to the London wool sales, good prices are realized. Advantages of this method of sale are that the wool is seen by a larger number of prospective buyers, and active competition is generally assured.

Fleeces are, as a rule, the result of one year's growth. The term "double fleece" means that there is the growth of two years, the sheep having escaped clipping at the end of the first year. For fleeces of this type rather lower prices are generally accepted. The finest and softest wool is cut from the animal when only seven months old, and is known as Lamb's Wool. A technical term for wool clipped when the sheep is twelve or fourteen months old is "Hogget." The second and following clips are known as "Wether Wool."

Valuation of Wool

The value of wool depends on the fineness, length, and strength of the staple, the colour (the best types of wool are whitish in appearance), and the "handle," by which is meant the degree of softness and elasticity. The fleeces are, as a rule, sold "in the grease," the amount of grease, dirt, and other foreign matter being taken into account. Greasy wool might be sold at 20d. per lb., or "cleaned scoured" cost 40d., which means that 100 lb. of wool in the grease would lose 50 lb. in the course of cleaning.

XLIII.—WOOL SALE CATALOGUE DESCRIPTIONS

In the last chapter terms were discussed which are commonly used in the wool trade down to the time when the fleeces are skirted and the different qualities and lengths are sorted and baled ready to be dispatched to market for sale.

The next procedure is for specifications of the different qualities and the gross and net weights of each bale to be sent to the selling broker. Before sales take place in London a pound of the wool is drawn from each bale and sent to the selling broker's sample room, where it is examined and compared with the specifications. After the sample has been valued the various "lots" are catalogued. It is the custom in the London wool trade to sell all "star" lots—*i.e.*, all the lots of three bales or less, in a separate room, and the large lots in the main room.

On the outside of the catalogues is printed the number of bales to be offered for sale, together with the countries and the States in Australia in which the wool was grown. Immediately inside the catalogue will be found particulars of the different warehouses where the wool may be seen. Then follows much information which is likely to be needed by prospective buyers. The names are given of the ships in which the wool has been brought to this country, or, in the case of English wool, or wool brought by rail to London from another port, "land carriage" is indicated.

FACTS FOR PROSPECTIVE BUYERS

Then there is given a description of the wool, the various qualities being exceedingly numerous. First, it will be shown if the wool is greasy, scoured, slipe, or washed. The class of sheep from which the wool has been clipped is then set out. Representative types are merino, comeback, ¼-bred, ½-bred, ¾-bred, cross-bred, Lincoln, Romney, and Southdown. The quality will next be described, terms in use including extra super, super, first, second, superfine, and fine. The information respecting the description of the wool will be completed by a statement as to whether it is "combing" or clothing wool, or consists of wool clipped from the neck or other part of the animal, and whether it is in the form of pieces, locks, "crutchings," or is "broken," or of "a double fleece," or if it was cut from a dead sheep, and if the wool is from lambs, ewes, wethers, hoggets, or weaners, or is black or grey in appearance.

Under other headings will be shown the numbers of the lots, the tare of the bales, and the marks and numbers of the bales. The assumption in the case of wool from Australia is that, unless otherwise described, it is merino. Wool grown in New Zealand is largely cross-bred. Representative descriptions of wool appearing in a London wool sale catalogue would be as follows:—

Greasy Super Combing,
Slipe ½-Bred Super Lambs,
Slipe Cross-bred Fine Clothing,
Washed Cross-bred Lambs,
Greasy Cross-bred 1st Dead,
Scoured ½-Bred Necks,
Greasy Fine Cross-bred Hoggetts, and
Scoured Cross-bred Stained Pieces.

In London every bale of wool to be offered at auction is on show during the morning of the sale, when the light should be good. Prospective buyers view the wool, and it is sold in the Wool Exchange, Coleman Street, E.C., in the afternoon. It is the custom of the trade to allow 1 lb. per cwt. for draft. The wool is sold at so many pence per lb., at advances of one farthing, until the price of 15d. is reached. Thereafter, advances are of ½d. each. After the wool has been bought by the manufacturers, or dealers, the fleece is sorted by them into its different descriptions, and is termed "Matching."

PREPARATION OF BY-PRODUCTS

When wool is sold "In the Grease," the latter is extracted by the "Scourer." It has its commercial value, and is known in household use as "Lanoline." Potassium salts are obtained from the "suint," or perspiration of the sheep, and are another by-product of "wool in the grease." It is a well-known axiom that, in commerce, nothing is wasted. Sometimes fleeces, before they are offered for sale, are scoured. For "scoured wool" higher prices are paid, since there is no grease to increase the weight.

Besides fleece wool there is "skin wool." This is the wool of sheep that have been slaughtered. The skins, or "pelts," are bought by fellmongers, who treat them either by sweating or with a chemical such as sodium sulphide or lime. Wool treated in this way with lime is known as "slipe wool," or "slipes." By each process the wool is easily removed from the pelt.

DEFINITION OF TOPS

After the wool has been acquired by the manufacturer and is scoured, the first process is to comb it. For combing, two types of machines are used. One is known as the "Preparer," and is used for long wool, and the other, called the "Carder," is employed for short wool. By combing, the wool is opened up and the fibres are arranged in parallel form. The weak, short, and irregular fibres and all vegetable impurities are separated from the strong fibres. Sometimes the wool is combed in oil, so that it may have an easier passage, but it is also combed dry. The resulting product of combing is known as "Tops." These tops take the form of continuous bands of wool, which is wound crosswise to prevent its clinging on to the bobbins. The tops, consisting of a mass of wool, are used for spinning into yarn.

XLIV.—COUNTS OF WOOL

The quality of sheep's wool is denoted by its thickness, and numbers, or "counts," are given to the wool by the topmakers to distinguish the different grades.

The fibre of wool is of a minute diameter. The very finest merino wool is about 1/3500ths of an inch in diameter, and from 40,000 to 48,000 fibres are grown in a square inch. This description of wool is from 2½ in. to 6 in. long. It is, roughly, seventy times finer than the coarsest wool, which is longer, and ranges up to about 15 in. in length.

The term "40's" signifies one of the most usual qualities. It includes English wool and coarse Colonial cross-breds. Its average fineness is 1/600ths of an inch in diameter. The "count" given to the wool in the worsted trade means that this is the number of hanks, each of 560 yards, which could be spun out of 1 lb. of "combed top." So the count 40's signifies that combed top of that description of wool would yield a uniform yarn of such fineness that 40 hanks, each of 560 yards, would weigh 1 lb. A "90's" represents fine merino wool of from 1/700ths to 1/2200ths of an inch in diameter. Ninety hanks would weigh 1 lb. In other words, 1 lb. of 90's fine merino combed tops should produce yarn which, if spun into one length, would represent twenty-eight miles of yarn.

Sometimes wool, after it has been scoured, is still too seedy to be combed or carded at once. It is then carbonized, seeds and vegetable matter being converted in carbon by such an agent as sulphuric acid. After carbonization the wool is passed through corrugated crushing rollers and then through a neutralizing machine to counteract the acidity.

Representative Colonial Types

In the raw wool trade there is no count below "32's." Representative counts in the Australian and New Zealand trades, signifying cross-bred wools, are 36's, 40's, 44's, 46's, 48's, 50's, and 56's. Wool known as 40's is used largely for the manufacture of rough tweeds and other material of a strong type.

A count of about "58's" represents the wool of a "Comeback," which means the wool of a sheep which has been bred, through a cross-bred, practically back to a merino. At about the count "60's" merino wool appears on the scene and includes the counts ranging up to about 70's, at which point fine merino starts. An "80's" would represent a superfine merino wool. Manufacturers in Great Britain are not much interested in counts above "80's." They are used by Continental manufacturers for fine dress material and hosiery.

Counts of English Wool

In the trade in English wool Lincoln is generally "36's," Leicester, Nottingham, and Cotswold are "40's," Romney Marsh is included in the counts from "44's" to "48's." Down wool and Dorset, Wiltshire and Hampshire wool are generally from "50's" to "56's," and Southdown wool is from "56's" to "58's."

Wool of various counts is blended by manufacturers, their art in doing so being valuable individual assets.

"Down wool," a term often used in the English raw wool trade, may be defined as the wool of sheep bred on the downs of England. It is usually rather short and of a "fuzzy" character, and is of medium to fine quality. The term "Down" in this connection is not to be confused with the down which grows close to the skin of some animals and, by reason of its softness, is more valuable than the protecting long hair. Examples of down and hair are described in the following chapter.

Meaning of Noil

When, in the course of combing the long sheep's wool, the tops are separated, with all the fibres parallel, the "noil" remains, which is really the waste from the combing process. Here, again, there is a marked distinction in the representative values of the tops and noil derived from the protecting cover of the sheep and of certain other animals. In the case of sheep's wool it is the tops which are the more valuable, and in the case of some animals, such as the camel, it is the noil which represents the more costly commodity.

Worsteds and Woollens

The difference between tops and noil leads to a general distinction between the meaning of the terms "worsteds" and "woollens." Worsteds are made from combed tops, and the fibres in them run parallel. Woollens are woven from carded, as distinct from combed, wool. In woollens the noil is used, and the fibres run in various directions.

Low Wool

The term "low wool" is used chiefly to mean wool from Asia, Russia, and North Africa, and is employed in the manufacture of carpets and blankets. These types of wool are sold separately. In the low wool department of brokers there will also be dealt with the rarer fibres, such as cashmere, alpaca, mohair, and camel's hair. The wool handled in the Colonial department, in which South American wool is also included, covers wool used mainly for the manufacture of ordinary clothing.

XLV.—CAMEL'S WOOL, CASHMERE, ALPACA, AND MOHAIR

In the preceding chapter the point was made that, anomalous though it may seem at first, there are dealt with in the low wool departments of leading brokers' offices some of the rarer types of wool and also of hair. A distinction is made between the descriptions of Colonial sheep's wool, including South American wool, which are sold at the regular auctions of Colonial wool, and the other types of wool and the descriptions of hair which are sold at auctions held at less frequent intervals and are also disposed of by private treaty.

The prevailing idea is now that no hard-and-fast line can be drawn between wool, hair, and fur. Many animals have long hair protecting a layer of wool or fur, which gives them warmth. Of the various animals, besides sheep, whose covering is dealt with by wool brokers, the most important, as far as quantities are concerned, is the camel. The chief source of supply of camel's hair and camel's wool is China. In a recent year some 10,500 bales were imported into this country.

Camel's Hair and Down

Strong hair grows on certain parts of the camel, notably in the form of mane, and on the hump. On other parts of the animal down grows, which is known as camel's wool. Both the hair and the wool are "helped off" by the natives. The hair and the wool are cleaned—*i.e.*, willowed—sorted, and stored in European warehouses in China until they are shipped to this country. The product is sorted into three main classes, the "firsts" including the softest and finest down, and the "thirds" containing the coarsest description of hair. The remainder, representing descriptions of down and hair ranging between these qualities, is put into the second class, and is known commercially as "seconds." The hair and down are pressed by hydraulic machinery into bales weighing about 400 lb. each, and are sold in London on the basis of standard brands.

The finest type of camel's hair comes from Western China, and is known as Sikau. Hair also comes from Pekin, but as camels are largely employed at the coal-mines in the neighbourhood of that city, the hair and down of such beasts of burden are usually of a lower class, and prices offered for them are much below those ruling for supplies from Western China.

Long camel's hair is largely employed in the manufacture of press cloths and belting, while the down or wool is used in the manufacture of light clothing and underwear and rugs, especially motor rugs. The artists' brushes, commonly known as camel's hair, are seldom, if ever made, of that fibre at all, but mostly consist of the silky tail hair of the skunk or kolinsky.

High Prices for the Product

Cashmere may be described as the covering of the Cashmere goat, which is to be found mainly in China. Only a little cashmere comes from India. The goat has its strong hair and "kemp," for which comparatively low prices are offered. The down is sorted into two main qualities known as "firsts" and "seconds." It ranges in appearance from white, through grey-brown shades, to a deep brown. The down, like camel's wool, is willowed and is baled under hydraulic pressure, and for the finest qualities very high prices are paid. Cashmere is used in the manufacture of soft shawls, scarves, and other ladies' luxuries of high value.

Chief Descriptions of Alpaca

Alpaca may be described as the covering of the alpaca, a camel-like ungulate, which is domesticated in Peru. It is helped off the animals by the natives by means of rude implements, pieces of broken glass even being used sometimes for the purpose. The product is divided into two main classes, known as "Fleece" and "Seconds," the latter including the short pieces. It is of various colourings, some being white and other fleeces being light fawn, light brown, dark brown, grey, piebald, and even black. The fibre has a soft, lustrous character, and is used largely for linings for dresses, braiding, and for light coats and suits. The covering of the lama is somewhat similar to that of the alpaca, but is of a rather rougher nature. It corresponds, broadly, to alpaca seconds.

The vicuna, from which vicuna fibre is obtained, runs wild in the mountains of Peru, and the animals are only secured by being shot. Vicuna, on account, largely, of its softness, may, perhaps, be regarded as the finest of all textiles, and only reaches this country in very small quantities.

TYPES OF MOHAIR

Mohair represents the covering of the Angora goat. The animal originated in Turkey, but it is now largely bred, in the domesticated state, in South Africa. Attempts have also been made to breed it is Australia and the United States. The finest description is known as "Fine kid fleece," and, as the term implies, represents the soft and lustrous hair of kids. Firsts and seconds are the growth of matured goats. The covering of the goats is clipped twice a year. The "winter hair" is shorter than the "summer hair," and so "Winter Firsts" command a lower price than "Summer Firsts." "Mixed" represents the rougher type of hair grown on goats chiefly in Basutoland. The goats are also cultivated in the neighbourhood of Lake Van, Asia Minor. Mohair is largely used in the manufacture of plushes and other material in which a lustrous appearance is needed. A considerable impetus has been given to the trade in mohair by the development, in recent years, of the cinematograph industry, owing to the large demand for mohair plush with which to cover the seats.

XLVI.—SHODDY AND MUNGO

When wool has served its purpose in forming the basis of original manufactures its day is not always over, for it is often given a fresh life of utility in the composition of reworked wool.

Not long ago a statement appeared in *The Times* that the steamer *Sophie Marie* had brought to Hull from Petrograd a cargo of 1,500 bales of rags, consisting of the cut-up uniforms of Russian soldiers, military shirts, epaulettes, decorations, and socks. Much of this cargo would find its way to Dewsbury, the centre of the rag and shoddy industry in England. There are several firms of rag auctioneers in that city who offer such goods by auction three days a week on precisely the same lines as wool is offered in the London auctions.

AN IMPORTANT INDUSTRY

The existence of the rag industry is brought to the notice of most people living in towns by the itinerants wheeling barrows who go from door to door seeking odds and ends. Many of these articles, the beauty of which has been marred by wear and tear, form excellent grist for the mill. Accompanying these odds and ends of used substance will be snippets and other waste unused material from the cutting-rooms of dressmakers and wholesale tailors. Not having been destined to

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appear in the first place as part of some lovely dress or expensive suit of clothes, they may come before the public again in quite a different guise as part of material woven from reworked wool. The rag trade is an important industry, the weight of the rags pulled up each year amounting to many thousands of tons, and it provides another example of the axiom, one of which is given in page 161, that in commerce there should be no waste.

Various Qualities of Shoddy

The term "shoddy," which is used in the rag industry, is often applied to manufactures in a deprecatory sense, which is not always justified. An accurate definition of shoddy is re-worked wool, or extract wool, with or without an admixture of virgin wool. Shoddy is produced in various qualities and shades. Practically every quality of wool is reproduced. Some of the wool is rewoven in the natural colours given by sorting, but usually it is dyed, the material lending itself to the same treatment in this respect as raw wool.

As a rule, rewoven material is cheaper than that made from fresh wool. The wool in the course of use has lost part of its springiness, but the fibres of used material are sometimes employed actually to improve the surface of fine cloth.

Process of Re-Manufacture

Shoddy is usually made from knitted goods, hosiery, and all loosely woven materials which were originally manufactured from the combed tops of wool. After being shaken, to eliminate dust, the rags are carbonized for the purpose of destroying any cotton which may have been used in the original manufacture for stitching or otherwise. In most cases the rags are then dyed, and the processes of pulling and scribbling follow. Often the re-worked wool is blended with raw wool or cotton, and it may be manufactured into every form of textile fabric.

Description of Mungo

Mungo is usually remanufactured from the short-fibred types of wool which have been carded, or from the noil, representing the waste after the tops of long-fibred wool have been separated. Mungo may be described as possessing a shorter and more felted appearance than shoddy.

The reported origin of the term "mungo" is described by Mr. Frank Ormerod in his valuable book on "Wool." He recalls how it is told that, in the early days of the shoddy trade, a keen Yorkshire factory master had set his spinner the very difficult task of trying to spin something which was little better than food for the furnace. The spinner, after several efforts, went to his master and told him that it was impossible to get the stuff to hold together sufficiently to make it into threads. But the blunt old Yorkshireman would not hear of failure and sent the spinner back to his work with the injunction, "It mun go; it mun go!" ringing in his ears. Ever since, it is said, the term mungo has been used in the trade for this particular kind of stuff.

Extract, Flocks, and Merino

"Extract" is another word largely used in the trade and appears in the title of a company owning several of the most important factories. Extract represents wool fibre which has been extracted by chemical process, either by carbonization or dipping, from fabric which was originally woven with a cotton warp.

The term "flocks" represents the refuse or waste from wool and, sometimes, cotton in the milling machines.

"Merino" is a term given to the rag-wool made from women's fine dress materials originally woven from the wool of the merino sheep.

"Worsted" is a term applied to the remanufacture of worsted clothing. It is distinct from "worsteds," which, as explained in page 166, represents the original manufactures of wool tops.

XLVII.—SILK "IN THE GUM"

MEASURED by quantities, the silk industry ranks far behind the cotton and wool industries. Judged, however, by the values of equal quantities, silk ranks far ahead of both cotton and wool, since the value of a pound weight of silk yarn is ten or twelve times that of a pound weight of cotton or wool yarns.

The silk industry in Europe has, in later years, undergone important changes and developments. These include the introduction of the power loom, in place of the hand loom, the weighting of the thread, either in the skein or in the piece, and the development of imports of silk manufactures woven in Japan. In quite recent years there has been a new factor in the production of artificial silk, which, as the name suggests, is the product of a chemical process. It is noteworthy that, in spite of the enormous development of this industry, the consumption of real silk has not declined. One conclusion is that those who now buy garments made of artificial silk would, in the past, have largely relied on cotton, wool, or union fabrics.

ENGLISH AND FRENCH TERMS

A distinctive feature of trade terms used in market reports of silk is that they appear in both English and French. The use of the French terms is, of course, explained by the important position occupied by France, and especially Lyons, in the silk industry.

The use of special terms begins with the reeling off of the fibre from the cocoon, this reeling being also known by the French term "filature." The product of this reeling process is "raw silk" or "grège." Raw silk in this primary stage is of too fine and delicate a nature for ordinary use, and so it undergoes the process of "throwing," the purpose of which is to twist, or double, the fibre for the production of more substantial yarn. The operator is known as a "throwster," and the resulting product is known as "Thrown Silk."

In this stage the yarn is always handled "in the gum," which means that it still has on its surface the coating of albuminous matter which surrounds the fibre as it is reeled off the cocoon. The covering of "gum" tends to give the fibre more substance than it would, in that stage, possess without it.

Types of Thrown Silk

Thrown silk is used for weaving purposes in different "doublings," or twists, known as "singles" or "grège," "weft" or "trame," and "warp" or "organzin." For producing silk for sewing purposes and certain other uses, the throwster employs other doublings and twists.

The singles, or grège, are used for weaving tissues "in the gum," the tissue being subsequently dyed in the piece, the weft, or trame yarns and the warp or organzin yarns being "boiled off" or scoured before being dyed in the skein.

TITRAGE AS A UNIT OF MEASUREMENT

Corresponding to the counts in the wool and cotton industries, which indicate the relation between length and weight of the yarn are, in the silk industry, counts or "titrage." The titrage was based by the Paris International Congress of 1900 on a unit of weight of a denier and a unit of length of 450 metres, and this obtains whether in the single, double, or more threads joined together in the doubling process. Thus, count 13/15 means that 450 metres of silk yarn of that doubling would weigh from 13 to 15 deniers. Obviously, therefore, the lower the numbers by which the unit of weight is multiplied, the finer the thread.

Unlike the cotton trade, the silk industry has no fixed standards of quality. There is, however, a market classification according to the quality, regularity, cleanness, and elasticity. These qualities are known by such terms as "extra," "firsts," and "seconds," etc. Yarns exported from China are marketed by the names of brands. Sample skeins drawn from bales are submitted and purchases are made on the basis of them.

CONDITIONING OF SILK

In each silk centre are "conditioning houses" in which the silk is "baked," with a view to driving off the moisture. The silk is baked dry, and then 11 per cent. is added to the weight, this being regarded as the normal percentage of moisture in silk yarn, and a certificate of this weight is given by the conditioning houses to the buyers.

In this country there exists an important and successful industry in spun silk, which is made from what is termed "silk waste." The latter consists of the fluff round the cocoon, the pierced cocoons from which the moth has emerged, damaged cocoons, and refuse from reeling, etc. This industry has been made practicable by the machinery perfected by Lister for spinning it. There are two kinds of resulting products, which are often of a most attractive appearance, known as "schappe" and spun silk respectively.

XLVIII.—TUSSORE AND SPUN SILK

Wild silks reeled from cocoons of various worms in the Far East feeding on different trees have attracted attention at times, but the only sort to take a permanent place in the silk trade has been that of the "Tussore," or "Tussah," worm, a native of Mongolia, which feeds on oak leaves. This fibre presents, under the microscope, the appearance of a twisting ribbon distinct from the round fibre of the cultivated silk structure which accounts for the metallic glint of tissue woven from Tussore silk. This type of silk is not considered to take the dye satisfactorily, and is sold chiefly scoured or bleached, but it always retains a more or less yellow appearance. It is sold under the trade name of Tussore silk, or Shantung. It is largely used for women's costumes and men's suits.

The resulting product of treating silk waste, which was described in the previous chapter, is divided into two distinct descriptions known as schappe and merely spun silk, or "Discharged Spun Silk," respectively. Before the silk fibre can be used in machinery to any advantage, the gum coating left by the worm must be dissolved and washed away and, according to the method employed to achieve this operation, the resulting product is either a schappe or spun silk respectively. In France, Italy, and Switzerland the "Schapping" process is employed whereby more gum is left in the waste than in the "Discharged" process. The product of the schapping process is generally regarded as being neither so bright nor so good in colour as the discharged silk, but it is very clean and even, and for some purposes it is absolutely essential as, for instance, in the manufacture of velvet.

Treatment of Silk Waste

The silk waste is treated by various processes of "beating," "opening and filling," and "dressing," which result in drafts, classified according to their length of fibre, in preparation for the spinning process, which is conducted on the same lines as the spinning of cotton or wool. The noils resulting from the dressing operations are sometimes combed, the combs being similar to those used in the cotton trade. The resulting sliver (a term used in the wool trade) is taken by spinners who specialize in spinning short fibres, and the exhaust noils are bought by those who spin them into "Noil Yarns" on the same principle as the spinning of wool noils.

Until recent years the silk noil yarns were mostly used in the manufacture of gun cartridges, and during the Great War the production of this type of material was on a vast scale. At the end of the war large supplies of the material remained in the hands of the Allied Governments and were subsequently sold in the silk trade. The rough, coarse fabric has since been sold for women's tennis and seaside costumes under the name of Bourette. The noils are also used for mixing with wool to provide fancy effects in woollen cloths.

CONTINENTAL DEVELOPMENTS

Spinning on the Continent of Europe has greatly developed in recent years, and large syndicates have been formed in France, Switzerland, and Italy, which practically control the prices for yarns and raw materials. Since the Great War the Japanese have organized a silk spinning industry of some importance.

Spun silks are used extensively in the manufacture of various forms of silk tissues of uniform type, or, in association with other yarns in warp or weft, in the pile of velvets and plushes, and also in the production of laces and sewing silks.

XLIX.—ARTIFICIAL SILK AND SILK MANUFACTURES

THE terms "Artificial Silk" or "Art Silk" are given to the fibres which have been produced in recent years, to an ever-increasing extent, by synthetic processes. The production of these fibres represents by far the greatest development in the textile industries for many years.

The raw material used as a base in the manufacture of these fibres is cellulose, which is found either in a pure state in cotton or is extracted from wood by methods similar to those used in the production of wood pulp for paper. Whatever may be the source of the cellulose employed, it is necessary for the manufacture of artificial silk that the substance should be first reduced to a thick liquid state, like the silk in the glands of the silkworm, and then be forced through minute tubes in order that it may acquire the form of a continuous thread. Cellulose, however, is a solid product insoluble in all the solvents usually employed, and to make it capable of being dissolved, it must be passed through certain chemical stages, after which a more or less modified form of cellulose is obtained.

METHOD OF PREPARATION

There may be said to be two general methods for the transformation of cellulose, the one being by treatment with acids, and the other being by treatment with alkalis. In the first case, by certain processes, nitrate or acetate of cellulose is obtained, and these, in their turn, yield what are known as "Chardonnet" and "Celanese" types of artificial silk. By the second method of treatment the cellulose yields, after undergoing various processes, "Copper" artificial silk and "Viscose" artificial silk.

The physical properties of all these fibres vary with the chemical differences. They vary in their absorption of moisture and also in their resistance when wetted, and it must be acknowledged that the employment of these fibres in the manufacture of materials still presents difficult problems. Such, however, is the activity in all the branches of this new industry and such remarkable progress is being made that great developments may be looked for in the immediate future. To-day the production of the synthetic types of silk exceeds the production of real silk.

The great increase in the production of artificial silk is due, largely, to the lustrous beauty of the fibre. It is now extensively used in the manufacture of "artificial" or "art" silk tissues and in combination with real silk, spun silk, wool, and cotton. Its greatest use is on the mechanical knitting loom for the production of "stockinette" tissues for hosiery and women's jumpers, etc.

Manufacturing Developments

Outstanding features during the last thirty or forty years in the weaving of silk tissues have been the cheapening of the resulting product by (1) the introduction of power weaving, and (2) the perfecting of the metal-weighted dyeing processes in both skein and piece dyeing, whereby silk is replaced by and combined with tin. The effects of these developments have been to popularize the product and generally to increase the consumption largely. During this period there has throughout the world been a great growth of the trade in Japanese indigenous white silks termed "Habutai." Another feature during this period has been the development of silk manufacturing in the United States, which now absorbs five-eighths of the whole of the world's production of raw silk, thus leaving only three-eighths for other countries.

MAIN TYPES OF TISSUES

Manufactured silk materials may be classified, broadly, into plain tissues, crepe tissues (made from high twist yarns), figured tissues, and pile tissues. The numerous descriptions represent the results of variations in the weaves or intersections of warp and weft. They may be manufactured from real silk only or they may be produced in "unions" with cotton, wool, or artificial silk. The prices vary largely according to the precise constituents.

Among plain tissues are included the materials known as taffetas, ottoman, paillette, grosgrains or failles, satin de Chine, bengaline, reps, satin, merveilleux, and popeline. Crêpe tissues include crêpe de Chine, crepon, marocain, charmeuse, and georgette. Among figured tissues may be mentioned damask, brocade or broche, and lampas. What are known as pile tissues include velours or velvet and plush.

L.—WATER-RETTED FLAX

Some of the terms employed in the marketing of the flax crop indicate the form of preparation. In Ireland, France, Belgium, and Holland the farmer, or peasant, never sows a large area with flax seed, but only a few acres, which he knows can be cultivated with home labour. The soil is carefully prepared to a fine degree of tilth, and sowing takes place in March-April. By the end of July the straw is ready for harvesting, and is then pulled—not reaped. If the seed is to be saved the straw is tied in bundles and left in the fields to dry, and when ready the seed is rippled by the pulling of the straw through combs. Then follows retting, of which there are two distinct processes. One is water-retting and the other is dew-retting. In Soviet Russia the bulk of the crop is dew-retted and is known as Slanetz. There is also a well-known type of flax known as dew-retted Belgian, but in the countries of Western Europe the water-retting process usually prevails.

In the process of water-retting the bundles of straw are submerged in steeps and ponds, or in sluggish rivers, such as the famous Lys in Belgium. This process has to be very carefully supervised, and the straw needs to be withdrawn from the water immediately it can be easily detached from the fibre inside. The process of water-retting lasts from three to six weeks, according to the temperature of the water. On removal from the steeps each bundle is cut, and is stood in umbrella fashion in the fields until it is thoroughly dried. It is then either sold to the scutch mills or is given out to be scutched on commission. The first process of preparation consists of putting the dry, retted straw through a breaker, or a kind of fluted mangle, after which the scutch wheels beat the broken straw from the fibre.

Retting by Dew and Rain

When flax is to be dew-retted the straw is spread out on meadow lands, and the retting process takes place through the influence of the dew and rain. The straw needs to be turned at intervals, so that no part of the stalk should become unduly moist or dry. In the Baltic States all the flax is water-retted, but the breaking and scutching of the straw is done by the peasants at home. Since the Great War Great Britain has again taken supplies from Russia and also from Latvia and Esthonia.

The main descriptions of water-retted and dew-retted types of flax are again subdivided into various descriptions.

The uses of flax are many. They range from the composition of the material for sacking, of which jute is the chief substance, and strong canvas and tarpaulin, to the finest damask linen produced in Ireland. Flax is also used for all forms of thread requiring special strength and durability, and is employed in the sewing of boots and shoes.

Before the Great War Great Britain looked mainly to Russia for the bulk of her supplies of the raw material. The imports from Russia ranged between 60,000 and 80,000 tons per annum, out of a total Russian annual exportation of between 250,000 and 300,000 tons. In addition, Great Britain used some 20,000 tons of other types of flax, mainly those grown in Ireland, Belgium, and Holland, making a total annual consumption of about 100,000 tons.

NEW SCUTCHING MILLS

With the outbreak of war, the securing of the necessary supplies from Russia became a serious problem. For a time a fairly steady flow passed through Archangel. Later, when Russia was thrown into chaos by the revolution, the supplies from that country ceased. It was natural, therefore, that efforts should be made to establish a flax-growing industry in the United Kingdom. New retting and scutching mills were built at Peterborough, Selby, and Yeovil, and in Fifeshire. They were constructed by the Government in 1918 and 1919, sold, subject to mortgage, to syndicates, and when the latter had lost as much capital as they felt they could afford the mills were closed. Attempts are, however, still being made by private initiative to solve the problem of flax cultivation in the United Kingdom.

LI.—SORTS OF SLANETZ FLAX

Before the Great War there were established a number of merchant houses, of British, French, and Baltic-Russian nationalities in the Russian cities of Petersburg, Pskoff, and Riga, which were represented by branch buying establishments in the interior, where direct purchases were made from the peasants and dealers. The practice was for the peasants to bring their flax from the villages to the buying-centres in small lots by cart or sledge. The flax was then bought on the bazaars by the buyers for the exporters. After, often, a considerable amount of haggling, a bargain would be struck, and the flax would be delivered to the exporter's warehouse, where his brackers, or sorters, graded it into the various descriptions peculiar to the districts. It was afterwards forwarded by rail to Riga, Reval, or Windau for shipment. When buying from dealers, the exporters bought parcels graded, packed, and ready for export, free on rail at an interior station, but the spinners always gave a preference to the exporters' own selection marks.

Present Methods of Marketing

Since the Russian revolution great changes have taken place in the system of trading. In Soviet Russia, owing to the suppression of free trade, the old merchant houses have disappeared, and their places have been taken by co-operative societies. A few of the former exporters still, however, remain as the middlemen between spinners and sellers. As was to be expected, the co-operative societies, through inexperience and lack of expert knowledge, were, at first, none too successful in their operations, and spinners were put to a great deal of inconvenience and loss, but, later, an improvement was noted.

LATVIAN AND ESTHONIAN FLAX

In Latvia the flax trade is a Government monopoly, and the exporter buys direct from the State, which delivers F.O.B. Riga. The Latvian selection has gained a high reputation for itself among consumers. In Esthonia and Lithuania the trade, after having been a Government monopoly for two years, is once again free, and is now conducted as in pre-war days, the only difference being that, in Esthonia, an *ad valorem* export duty is imposed on all shipments of home-grown flax. In Great Britain the favourite descriptions of dew-retted flax from Soviet Russia are known by the names of the districts in which they are grown—*i.e.*, Bejetsk, Kashin, Krasnoholm, and Ouglitch. The most popular descriptions of water-retted flax are known as Opotchka and Pskoff. The main forms of flax grown in Latvia are termed Schwaneburg, Livonian, and Hoffs. In Esthonia the principal sorts are known as Werro, Petchour, Dorpat, and Pernau.

FIVE PRINCIPAL SUBDIVISIONS

Each of the types of flax just named is graded into five principal sorts, the *écart*, or difference, being generally the sum of £5 per ton for Slanetz flax and £8 for water-retted flax. These five sorts of Slanetz flax are designated by the letters "F," "O," and the numbers "I.," "II.," and "III." The letter F signifies the Russian word "Fabritchnoi," which, in connection with flax, means "fibre suitable for a mill." As, in the early period of flax spinning in Russia, the best type of flax was taken by the mills, the word Fabritchnoi represented the best qualities. The letter O stands for the Russian word "Otbornoi," meaning a type of flax "laid aside, or selected from the inferior qualities." The price for No. I. sort is the basis, so that the quotation for O will be £5 per ton more, that for F £10 more, that for No. II. sort £5 less than that for No. I., and the price for No. III. sort £10 less.

There is also a lower type of flax grown in Russia termed Rjeff. This type is again divided into five descriptions, known by precisely the same terms as those used for the other sorts of Slanetz flax.

All descriptions of flax sent from Latvia and Esthonia are also classified into five different sorts, known, respectively, as R, Z.K., S.P.K., P.K., and K. The letters signify German words representing the peculiar types. Thus K stands for Kron, or Crown; P.K. for Puik Kron; S.P.K. for Superior Puik Kron; Z.K. for Zins; and the letter R for Risten, which is believed to be derived from the word Röste, meaning "retting."

LII.—GRADES OF BRITISH-GROWN FLAX

Small areas of land in certain parts of Canada were sown with flax before the war. In 1917 serious attention was given to the cultivation of the flax crop, and by 1919 syndicates were operating there on a fairly large scale. Dear labour and inexperience in handling the crop prevented, however, the production of the fibre on a profitable basis, and flax cultivation in Canada has now dwindled to very small proportions indeed.

In Australia a serious effort was made by the Government in 1918 to encourage flax growing, but after an experiment extending over two years the scheme was dropped, owing to the high costs of production.

Experiments were made in the cultivation of flax in Kenya before the war with fairly satisfactory results. The cheapness of native labour made the industry more attractive there than in the Dominions, and after the experimental stage had been passed, in the latter years of the war, it was thought that a suitable fibre could be produced in Kenya at a cost lower than that ruling in any of the European countries.

Recent Cultivation in Kenya

A large proportion of the new settlers, chiefly ex-officers, who flocked to Kenya in 1919 started to cultivate flax. It is to be feared that considerations of suitability of the soil or of the adequacy of the rainfall were not fully taken into account. In any case, the results in many instances were disastrous for a splendid type of pioneer. It seems unquestionable that flax can be grown in the highlands of Kenya on a basis profitable to the producer, but districts must be chosen where the rainfall is sufficient and where the crop is free from wilt and the caterpillar pest. It should be pointed out that the crop is most successfully produced when sown in March and harvested in July and the straw is held over to be dew-retted during the long rains in the spring of the following year. This means that about eight months must elapse between the sowing of the seed and the sale of the resulting product. Flax grown in Kenya is divided into five main grades, known as 1, 2, 3, 4, and 5 respectively. The bulk of the production is of No. 4 grade, or, in other words, of rather below a medium quality.

Decline in Irish Production

The Irish crop is concentrated in Ulster and practically the whole of it is water-retted. The maximum area under flax cultivation in the Free State is estimated at 7,000 acres. Irish flax is not graded, but is sold on its merits by the farmer to the spinner. The quotations given in market reports are simply for "Irish flax."

Descriptions of French Flax

Four well-known regions in France yield flax—namely, Brittany, Normandy, Bergues, and Picardy—and the flax grown there is known chiefly by the geographical names. The production of flax in Brittany is about 3,000 tons per annum of a dew-retted description. The fibre is of a supple type, and the yarn produced from it gives a better result in the bleaching process than the yarn spun from any other description.

Flax culture in Normandy is of considerable importance, but 75 per cent. of the straw harvested is dispatched to Belgium and retted in the River Lys. A strong, coarse-fibred description of flax is produced in Bergues, part of which is dew-retted and part water-retted. Picardy, where the cultivation is gradually dwindling, produces low quality descriptions of flax rather like the common Slanetz exported by Russia.

Flemish and Courtrai Types

The two main descriptions of Belgian flax are known as Flemish and Courtrai. Part of the Flemish flax is water-retted, is blue in colour, and is of an excellent fibre. Part is dew-retted and may be compared with the best quality of Russian Slanetz. "Courtrai" may be described as the king of flax, owing to the peculiar properties of the River Lys, in which the straw is retted. Valuable Brussels lace has its foundation in Belgian flax. The finest quality of Courtrai flax now finds its readiest market in Belfast. Any inferior straw in the Courtrai districts is dew-retted.

Six Dutch Descriptions

Descriptions of Dutch flax fall into six classes, known respectively as Blue Dutch, Yellow Dutch, Groningen, Zeeland, Dewret, and Friesland. From 85 to 90 per cent. of the total crop is water-retted, only the balance being dew-retted. Ireland buys the better qualities of the blue and yellow Dutch and Groningen descriptions. Scotland is only interested in the Friesland, Zeeland, and Dewret types, which are of lower grade than the descriptions bought for high-class linen manufacture in Ireland. The different descriptions of Dutch flax are not graded, each shipper having his own assortment.

LIII.—MANILA HEMP

The various fibres known commercially as "hemp" are grown in many countries. They thus differ in this respect from jute, which is cultivated in one country only. It is important to use the phrase "fibres known commercially as hemp" because the term hemp includes a variety of fibres which are not really hemp at all, but have in commerce been given that name, since they possess properties which enable them to be used for many of the purposes required of hemp itself, such as the manufacture of rope and cord, fishing lines, nets, and a number of other articles.

In trade the term hemp includes two distinct descriptions of fibre, which differ widely from each other in origin and appearance. These descriptions may be classified into hard and soft fibred hemp. The hard kinds include Manila (*Musa Textilis*), New Zealand (*Phormium Tenax*), Maguey fibre (*Agave Cantala*), and various descriptions of Sisal hemps (*Agave Sisalana*), Mexican sisal or Henequen (*Agave Fourcroydes*). The soft-fibred descriptions consist of Italian, Russian, and other European hemp, such as Hungarian and Serbian, and also East Indian hemp, all of which may properly be described as true hemp fibres.

Hard-fibred hemp is used almost exclusively in the manufacture of cables, cordage, and the heavier classes of twine, including binder twine used in reaping-machines for tying the grain sheaves.

Cultivation in the Philippines

Manila hemp may be defined as the product of the Abacá-tree, a species of plantain, which is cultivated in plantations in the Philippine Islands. It derives its commercial name from the capital of those islands and the chief port of shipment. The root of the tree has an average life of from twelve to fourteen years, and throws off at regular intervals shoots, each of which reaches maturity in about three years and attains a height of from about 10 ft. to 12 ft. When this height is reached the shoot is cut down and the layers of a pulpy nature of which it consists are stripped off, the outer and inner layers being thrown aside and only the intermediate formations being used. The bulk of the pulp is easily torn off by hand, and a thin strip of a fibrous nature is left, which is drawn through a somewhat primitive machine consisting of a heavy knife hinged on to a wooden bench. The pressure of the knife is increased, or relaxed, by a cord attached to a pedal worked by the foot, which enables the operator to produce a fibre highly or indifferently cleaned, as may be required. This primitive method is found extremely tiring by the natives, and their work is slow, the average production of cleaned fibre per man per day amounting to only between 12 lb. and 15 lb. Of late years experiments have been made to clean the fibre by mechanical means, and the results secured under efficient supervision are stated to be satisfactory.

Government Grading of Fibre

The two chief characteristics of sound Manila hemp are its great strength and its properties of resistance to the effects of sea water, which make it especially suitable as the constituent of rope. It is a ready absorbent of tar, which is generally applied to marine cables and ropes. In recent years a system of Government grading of the hemp has been introduced. Officials appointed by the Philippine Department of Agriculture inspect all parcels of hemp intended for export and determine the grades under which they may be sold and shipped. Certificates stating the grade or grades are then issued to the owner of the hemp, and these must be accepted by the foreign buyer as proof of quality. Unfortunately, buyers are known frequently to have had serious cause for complaint in regard to the quality of shipments made to them under this system, and urgent representations have been made from London to the Philippine authorities on the subject.

The price of Manila hemp varies widely in accordance with quality. As much as £60 per ton may be quoted for the best descriptions, while the market value of the commoner grades may be only about £22 per ton, C.I.F., London or Liverpool, which are the two chief marketing centres for the fibre in Europe.

LIV.—MEXICAN AND EAST AFRICAN SISAL

Fibre derived from the various forms of plants of the *Agave* family is known, commercially, as sisal, and is used for some of the same purposes as Manila hemp.

Sisal differs, however, from Manila hemp in that it is not suitable for the manufacture of marine cables and ropes, since it does not possess the power of resistance to the effects of sea water, which is so valuable a feature of Manila hemp. Sisal is of special interest for Great Britain, as its production is now being successfully carried on in British East Africa. While it is used, to a not inconsiderable extent, in the manufacture of cordage, it is chiefly employed as binder twine in reaping-machines. It is, as a rule, much shorter and softer than Manila hemp.

Mexican sisal may be defined as the product of the Henequen plant, and is cultivated in plantations in the Mexican State of Yucatan. The plant does not reach the producing stage for some years. Before the war the annual production of Mexican sisal amounted to about 180,000 tons, but, owing to unfavourable economic conditions, the output has since declined very considerably, and during the past few years it has not exceeded 120,000 tons. Its export is controlled by an institution under the auspices of the Mexican

Government, which has been trying to improve the status of the industry. The fibre is sold at prices fixed for definite periods, during which time market fluctuations are avoided, the selling price being fixed, more or less, in accordance with the market values ruling for competing fibres, and particularly for Manila hemp. In this way the interests of buyers as well as those of the planters are being safeguarded. For purposes of export Mexican sisal is classified into two distinct grades—namely, "good white" and "reds."

Types of East African Sisal

The term "East African sisal" includes the descriptions grown in Tanganyika, Kenya Colony, and Portuguese East Africa. The cultivation of the sisal plant in East Africa was introduced in the German colony at about the beginning of the present century, when young plants were imported from Mexico. The East African soil and climatic conditions were found to be highly favourable for the growth of the plant, and the experiment, largely owing to the thorough methods of the German planters and the interest taken in it by their colonial authorities, proved most successful. An efficient machine for the decortication of the leaf was devised by Krupps, of Essen, and, as a result, a type of sisal of high quality and tensile strength, and much superior to the fibre as produced in Mexico, was secured, and commanded a ready market in Germany and the United States. By 1913 the production of sisal in German East Africa had risen to more than 20,000 tons. Its price on the European market averaged from about £25 to £28 per ton, and left a handsome profit to the producers.

During the Great War the plantations suffered, however, severely, and when the colony was captured from the Germans the plantations were leased by the British Government to individuals. The plantations have since been sold to companies or private firms which have been endeavouring to re-estabish the industry in the high estimation of the markets of the world.

The cultivation of sisal in British East Africa (Kenya Colony) was introduced some years before the Great War, the young plants being obtained from the German colony. The industry, after experiencing many vicissitudes, now promises good results. The annual production in Kenya is estimated to be about 8,000 tons, and a steady development is anticipated.

Maguey Fibre and New Zealand Hemp

Maguey fibre may be described as the product of the *Agave Cantala* plant, which grows in the Philippine Islands. It is obtained from the leaf, and is softer and weaker than Mexican or East African sisal and is used, chiefly, in the manufacture of cheap cordage and for mixing with other fibres. It is classified into three distinct grades:—Nos. 1, 2, and 3.

New Zealand hemp (*Phormium Tenax*) completes the list of the principal types known as hard-fibred hemps. It is called flax in New Zealand, but it has no real claim to be so described. The fibre is obtained from the leaf of the plant, which grows, principally, in swamps. At one time it was largely used in Europe for binder twine

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purposes, but in recent years it has had to give place to sisal. Before the war the export of New Zealand hemp amounted to between 25,000 and 30,000 tons, but in 1923 the total export reached only 8,000 tons. The chief markets for this fibre are now in Australia and the United States.

It is estimated that the world's consumption of hard-fibred hemp for the manufacture of cordage and twine amounts to fully 375,000 tons.

LV.—TRUE TYPES OF HEMP

The soft-fibred varieties of the true hemp family may be defined as the product of the plant *Cannabis Sativa*. This plant is extensively cultivated in many European countries, and is grown to a smaller extent in Japan, British India, and the United States. It flourishes in varied soil and climatic conditions, and the nature of the fibre differs widely. Before the Great War the world's production of true hemp was estimated to amount to some 650,000 tons, the output of the various sources of supply being, approximately, as follows:—Russia, 400,000 tons; Italy, 80,000 tons; other European countries, 100,000 tons; British India, 30,000 tons; and Japan and other countries, 40,000 tons. The descriptions produced in the various countries are known, broadly, by the names of the countries, and then by names indicating particular grades. These grades are numerous. In certain countries, and notably Italy and India, there exist well-defined standards of quality which are regularly offered in the world's markets, while in others the hemp is sold by the exporting houses under their own classifications, which, in the course of years, have become known to their buyers.

Italian and Russian Types

The highest type of hemp is to be found in Italy, where the fibre attains great length and strength, and is of a beautiful, light, glossy colour. It is eminently suited for the manufacture of the best classes of twines and cords, as well as for the production of various descriptions of fabrics. During the Great War it was used largely in Great Britain for such divergent purposes as the manufacture of rope for the Navy and as a substitute for flax in the weaving of cloth. The principal standard grades of Italian hemp are known as P.C. (*Primo Cordaggio*) and S.B. (*Secondo Basso*). The former represents, as its name implies, fibre selected for cordage purposes, while the latter is of a fine spinning nature.

Russian hemp may be described as being, as a rule, inferior to the Italian fibre in point of length, colour, and quality. It is a ready absorber of tar, and in past years was largely used throughout Europe for cables and marine ropes. In recent years it has, to a great extent, been displaced in Western Europe for these purposes by Manila hemp, which is a much cheaper fibre. It is generally sold in foreign markets under the marks of individual shipping houses, and no recognized standards or grades really exist. As the result of the disastrous economic condition of Russia caused by the Revolution, hemp cultivation in that country has, in recent years, declined very considerably. Before the war 80 per cent. of the Russian hemp crop was consumed in Russia, the balance being exported chiefly to the United Kingdom and Germany.

INDIAN VARIETIES

Hemp grown in British India is inferior in quality to Russian hemp, being shorter, weaker, and of lower spinning value. It is cultivated chiefly in the Jubbulpore and Benares districts. Jubbulpore hemp has some resemblance to the lower descriptions of Russian hemp, while the Benares fibre, which is known in Europe as Sunn hemp, is of very short staple, but of light colour. Because of its colour and cheapness—it is the cheapest of all soft hemps—it is in large demand for the manufacture of shop twines. It is chiefly bought by Belgian spinners.

Retting and Scutching

Methods employed in the cultivation and preparation of hemp differ but little in the various countries. The seed is sown in the spring or early summer, and the plant is pulled from the ground by hand in the autumn. The hemp stems, known as "straw," are collected into bundles, which are submerged in water in so-called steeping ponds. Fermentation sets in and causes the outer layers of the stalks to rot. This process is known as "retting," and the duration depends on the temperature of the water and the nature of the hemp stalks. It lasts from one to three weeks. When retting has been completed, the bundles are withdrawn and the straw spread to dry. The seed-pods are then removed, and the straw is beaten by a flail-like wooden instrument, and in this way the fibre is cleaned. This process is known as "scutching." The seed of the hemp plant forms an important article of commerce. It is crushed by machinery for its oil, and the husks are then compressed into cake for cattle-food.

LVI.—TYPES OF SCUTCH AND HACKLED TOW

Tow is yielded in the treatment of various fibres, but chiefly of flax and hemp. It is divided into two distinct classes, known as scutch tow and hackled tow respectively.

Scutch tow is produced during the scutching process of the flax straw, and is of the lowest quality. It is suitable only for spinning coarse numbers of yarn. The scutching process consists of beating with scutch wheels the straw which has been retted and broken.

Hackled tow is thrown off the fibre when it undergoes the hackling, or combing, process.

Line and Tow

The long fibre is called "line," or hackled flax, and the short fibre which falls away is known as tow.

A special machine, called a "card," is used to form the tow into a sliver (a term also used in the wool trade), before it is spun into yarn and then woven into cloth.

When the lower descriptions of tow are produced they require, before the carding process, to be put through a "shaker," in order that the shive, or small broken straw, may be thrown out. This, in the process, falls away from the flax.

Tow produced from flax is employed in the manufacture of linen of not the most expensive type. Being weaker than the line, the tow yarn often represents the weft, while line yarn is used for the warp. Tow is considerably cheaper than line.

Types of Russian Tow

In those districts of Soviet Russia where spinning and weaving are carried on in the homes of the peasants, a very considerable quantity of tow is produced through the combing, or hackling, of the flax, and for this tow there has always been a ready market in the consuming centres of Europe. The largest amount of tow is produced in the eastern districts of Russia, and it is sold under the geographical names.

Well-known qualities of Russian tow are termed Kama, Siberian, Kotelnitch, Jaransk, and Viatka. Other favourite descriptions are known as Vologda and Novgorod. These types of tow were, in the days before the Great War, usually exported in the proportion of 50 per cent. of No. 1 and 50 per cent. of No. 2. The lower marks were sold to local spinners in Russia, but latterly the assortments for export have included a larger proportion of low marks.

Other Descriptions

Scutch tow is produced in all other countries where flax is cultivated. Thus there are Belgian, French, Dutch, Irish, and Kenya types of tow. They are known, generally, by the names of the country, or district of the country, in which they are produced, buyers being well acquainted with the types which are yielded in the various areas.

The broad distinction between scutch and hackled tow is that scutch tow is yielded in the treatment of tow after cultivation and before it reaches the manufacturers, while hackled tow is a by-product of the manufacturing processes to which hemp and flax are subjected before spinning into yarn. Hackled tow is thus produced whenever flax is combed for use in manufacture.

LVII.—GUNNIES AND HESSIANS

Dealings in jute take place in Mincing Lane, London, where the principal world's market for this product is situated. Very little jute is, however, actually brought there, buying and selling being carried out on the strength of recognized descriptions and grades. The dealers and brokers there have an international reputation as arbitrators, and all arbitrations arising out of Continental transactions are held in London.

Jute forms the wrappers of bales and the foundation of the bags in which many commodities are transported. Jute cloth, including gunny and hessians, may, indeed, be fairly described as the brown-paper of wholesale trade. It is used for containing a vast number of commodities, such as sugar, coffee, cocoa, rice, salt, and various grains and seeds. Jute is also the basis of floorcloth and linoleum, and is cheap and durable. It is a vegetable fibre produced only in India, and its cultivation is practically confined to the provinces of Bengal, Bihar and Orissa and Assam, and to Nepal. In the Madras Presidency what is known as Bimlipatam jute is grown to a comparatively small extent. The fibre is of less general utility than the jute cultivated in the other districts, and it represents only about 1 per cent. of the total crop.

The descriptions of jute fall, mainly, into four or five divisions, which may be subdivided into various grades or qualities. The raw material is grown from seed, mostly in small tracts, by the ryot, or farmer, and his family. The crop is sold either direct to dealers in the marketing centres up-country, or through the jute bazaars in Calcutta. In either case the jute is manufactured into cloth at the Calcutta jute mills or is packed by a baler for export, to be manufactured into the finished products in mills outside India. Jute intended for export is sorted and packed in the press-house. Each baler has his own registered marks, which indicate the grade or quality of the jute in the bale, and these marks represent "goodwill," the value of which varies according to the reputation of each individual baling firm. A catalogue of marks is issued by the Calcutta Baled Jute Association, each mark indicating the individual baler's ideas of grade or quality.

NARAINGUNGE

The first main type of jute is known as "Naraingunge," after the district in which this quality is produced. The distinctive character of Naraingunges is a strong, hard, bold type of jute, of good colour. "Diamonds" are a well-known description of Naraingunges, the market for which is comparatively small. They derive their name from the fact that balers have long been accustomed to print the form of a diamond on the tab attached to the bales. Other descriptions include "common daccas," uncut grades, and rejections. By the term "uncut" is meant fibre from which root has not been cut.

FIRSTS, LIGHTNINGS, AND HEARTS

"Serajgunges" rank next. They may be defined as a softer type of jute than Naraingunges, and, as a rule, they are not so strong. Main subdivisions of Serajgunges are "Firsts," "Lightnings," and "Hearts," although a comparatively small quantity of Serajgunge jute of higher quality is packed. Firsts may be described as a medium quality of Serajgunges. Lightnings represent an ordinary quality and owe their name to the fact that, originally, a baler drew a reproduction of a streak of lightning on the tab accompanying the bale, with the object, apparently, of indicating that the quality of the jute was a little below that of firsts. Similarly, Hearts, representing a common quality of jute, are distinguished by a heart drawn on the tab.

"Daisee" may be described as a very soft type of fibre of fair strength and of good spinning quality, but mixed in colour. It is grown in the neighbourhood of Calcutta. "Grey daisee" commands a premium. Other descriptions of daisee are sold under various marks, with four main sub-marks—1, 2, and 3, and rejections. The last term is applied to the lowest grades of all the descriptions.

"Tossa" is somewhat similar in type to daisee, but is stronger and of better spinning character. The colour is also somewhat mixed. It was originally grown up-country from daisee seed. In the course of manufacture different types of jute are mixed or "batched."

Gunny as a Generic Term

" Gunny," a word of Indian origin, may be defined as the generic term for all the manufactures of jute and of certain other substances woven in India. It includes both rough sacking and hessians. Jute cloth is largely woven in Dundee, but, strictly, the terms gunny, or gunny cloth, or gunny bags should not be applied to the manufactures of Dundee.

The term " Hessians," probably of German origin, is used to describe chiefly the lighter manufactures of jute cloth, as distinguished from the heavier cloth used in the production of sacks and bags. Hessians are also used in the manufacture of sacks of the lighter descriptions. The heavier sacking cloth, or, if spun in India, gunny cloth, would thus be used to contain wheat, flour, and certain heavy grains, while hessian bags would be employed for the offals produced in the manufacture of flour, since these are lighter.

HIDES, SKINS, AND FURS

LVIII.—RAW AND TANNED HIDES

THE important British trade in hides and skins may be divided into two main sections, known as "hair," or "raw," and "tanned" respectively. Sometimes, in connection with sales, the term "leather" is used in place of "tanned hides" to distinguish these sorts from "hair" or "raw hides," although they are in an unfinished state and need to be dressed by the curriers. The greatest proportion of the hides imported into this country are in the raw state.

In order to preserve the raw hides some form of treatment is needed immediately after the slaughter of the animals, and raw hides reach this country in "dry," "dry-salted," or "wet-salted" states. All raw hides are, at the outset, "poisoned." They are treated, usually, with a mixture of arsenic, potash or soda, and aloes. Hides which are to be shipped dry are simply poisoned and dried in the sun. When hides are dry-salted salt is rubbed into them as well as the "poison," and they are then dried. When hides are to be wet-salted they are, after they have been drained, opened up, and salt is shaken over them. They are then rolled up in a wet condition. The prices paid for hides treated in this way are less than those for dry-salted hides, because of the weight of moisture in them. The highest prices are bid for the dry hides.

Ox and Cow Hides

Most of the hides imported into this country represent the skins of oxen and cows. These are used, very largely, for the soles of boots and shoes and for leather bags, etc. The principal source of supply is India. Hides are also brought from South Africa, Australia, Argentina, North America, and the West Coast of Africa. Calf and goat skins are employed, to a large extent, for the upper parts of boots and shoes.

The term "kip" is applied to all raw hides exported from East India. A "Cape kip" is, however, a small hide shipped from South Africa and weighing from about 6 lb. to 8 lb. A "pelt" is the skin of a sheep with the wool cut off.

Classification of Raw Hides

Raw hides are classified according to the centre from which they are shipped and then according to the weight and quality. The three main divisions of weight are "heavy," "extra," and "light." The heavy hides range in weight from about 14 lb. to 22 lb., and the extra from 22 lb. to 40 lb. Both these are useful for the manufacture of strong sole leather. There are also what are known as "double extra" and "treble extra," written in market reports "extra extra heavy," "extra extra extra heavy." Light hides vary in weight from about 10 lb. to 14 lb. Calf skins range from about 3 lb. to 5 lb. in weight, and goat skins from about 1 lb. to 5 lb.

All raw hides are also classed according to quality by numbers—namely, firsts, seconds, thirds, and fourths.

Tanned Hides from India

Tanned hides, which are brought to this country, chiefly from India, are classified, primarily, according to tannages. Madras is an important tanning centre, and hides from this source of supply are classified, broadly, under the term " fair to good tannage," which represents the best quality, and then " ordinary to fair," indicating a lower grade or, when more detail is required, according to the district from which they are forwarded and then again according to quality.

Thus Bangalore tannages are subdivided into " prime," " fair," and " ordinary," the qualities varying largely in accordance with the colour. The prime quality is of a light colour. Mutvada tannages are classified as " best " and " ordinary," and Hyderabad likewise. The chief subdivisions of " coast tannages " are " best " and " mixed." Each of these subdivisions is again classified into qualities known as " seconds," " thirds," and " fourths." Consequently, sales might take place in respect of prime Bangalore tanned hides, averaging from 7 lb. to 9 lb. each and with an assortment of, say, 25 per cent. of seconds, 50 per cent. of thirds, and 25 per cent. of fourths.

Tannages of hides from Bombay are divided, broadly, into " good " and " fair to good," and then, also, into seconds, thirds, and fourths. The phrase firsts is not used in connection with tanned hides, although, as indicated above, it is applied to raw hides.

Heavy tanned hides weigh from 7½ lb. to 9 lb. each, and extra heavy from 10 lb. to 16 lb. The weight of a "light hide" would be from about 5 lb. to 7 lb., and that of a "small hide" from 4 lb. to 5 lb. Calf skins weigh from about ¾ lb. to 2¼ lb. each, and these are again divided into seconds, thirds, and fourths in the same way as the hides. It will be seen that, owing to the removal of extraneous matter, the tanned hides weigh considerably less than the raw hides.

Tanned Skin Descriptions

Tanned goat and sheep skins are classified according to the district and tannage. Thus, principal descriptions from Madras are "prime and best city," "fair to good town," "Trichinopoly and Dindigul," "Coimbatore" and "Salem, Bangalore, and up-country." All these are again subdivided into firsts, seconds, thirds, and fourths, the last designation corresponding to "Rejections." The Bombay tannages are primarily classified as "good" and "ordinary," and then by numbers, as in the case of Madras tannages.

Sales of hides are held in the City of London every three or four weeks. It is usual for the sales of raw hides to take place in the mornings, and for the tanned hides to be offered in the afternoons of the same days. Public auctions of tanned East Indian goat and sheep skins are held every seven or eight weeks throughout the year. In the course of twelve months upwards of 10,000,000 skins are sold in this way.

LIX.—DESCRIPTIONS OF FURS

As in the case of other industries, dealers in the fur trade have to look ahead, and furs bought at the winter and spring sales will be fashioned into garments to be worn in the following winter and in succeeding years. Between midsummer and the middle of October there is an interval between the public auctions, but, in the meantime, buying and selling continues privately between the various firms.

The trade in furs is one of those in which London is the principal market. Furs are brought to London from various countries, and buyers come likewise. At the public sales in London there are usually represented firms, apart from those in this country, in the United States, France, Italy, Germany, and many other countries. The values represented by the offerings are large. Thus at each of the periodical sales in the College Hill Sale Rooms in the City, the furs sold may easily represent a total value of £1,500,000.

Far Eastern and Australian Furs

At the auctions the sales of the various furs now always follow a regular plan. First place is taken by furs brought from the East and Far East, all of which are included under the single heading of "China Fur Sales." Included in furs sold under this single term are those of the tiger, leopard, wolf, jackal, marmot, China raccoon, red and kitt fox, marten, squirrel, China civet cat, kolinsky, pahmi, and Thibet lamb skins and crosses, kid skins and crosses, and goat rugs. By a "cross" is meant a piece of fur made by the sewing together of several skins, or parts of them, somewhat in the form of a Maltese cross.

Next are offered what are known as "fur seals" and "Australian furs." The latter include the Australian red fox, kangaroo, Australian opossum and ringtail opossum, wallaby, wombat, and the Australian house cat. The number of skins of some of these animals offered runs into hundreds of thousands.

After the sales of the China and Australian furs it is usual for the whole of the catalogue of the Hudson's Bay Company to be offered. Originally the furs of this company were confined to those brought from British North America, but in recent years the company has sold furs from a number of other centres. Then the four leading firms offer in turn their catalogues, which contain mainly North American furs and are divided into eleven sections. The order in which the different firms offer each section is determined by the drawing of lots, so that the furs in each section are offered by all the firms in turn before the furs in the next section are put up to auction.

SECTIONS OF GENERAL FURS

In the first section are the furs of the beaver, otter, marten, sable, lynx, fisher, ermine, sea otter, and chinchilla, if there be any of the last named valuable fur available, for it is becoming very scarce. Section 2 consists of the skins of the silver, blue, cross, white, and red fox. Section 3 contains only skunk, the skins of which are usually numerous.

Section 4 consists only of the American opossum, and section 5 of musquash. At some sales more than 1,500,000 skins of brown musquash have been offered, and, in addition, many thousands of skins of black musquash. North American raccoon is allotted sole place in the sixth section and mink in the seventh. In the eighth section appear the skins of the Russian squirrel, kolinsky and marmot, Persian lamb, and the North American and Russian fitch. In the ninth section are the furs of the wolf and bear. The tenth section includes the South American fox, badger, nutria, mole, monkey, whose skin in recent years has achieved increased popularity and is used largely for trimmings, leopard, and the house and wild cat. There is a considerable supply of the skins of house cats, which is secured both at home and from various countries. The skins of the black and dark-coloured cat are in most demand, and prices ranging from 1s. to 3s. 6d. each are paid for them. The skins of tabby and yellow cats do not secure such good prices, since it is necessary to dye them before use.

In the eleventh and final section are included furs which have been already dressed and dyed.

"Fine" furs are usually understood to comprise those in sections 1 and 2 of the general furs, although in the other sections there are many excellent furs.

LIST OF APPROVED TERMS

A complete list is now issued by the London Fur Trade Association of incorrect and approved descriptions of furs, the idea being to discourage the sale of furs by the names of animals other than those whose skins they actually represent. The association states that all furs which are shaded, blended, topped, dyed, or coloured should be so described, and all furs with white hairs inserted should have the word "pointed" before their name. Further, in order to describe a fur, the correct name should, in every case, be the last word of the description, and if the name of any fur or colour is used as an adjective, the word "dyed" or "coloured" should be inserted between the two.

LX.—APPROVED NAMES OF FURS

THERE is naturally a disposition among some of the numerous types of dealers in furs so to treat the more ordinary descriptions that they assume the appearance of the finest furs. There can be no harm in this as long as the fact is made clear to buyers that furs so treated are really imitations.

Good work in this connection has, as was indicated in the previous chapter, been done in recent years by the London Fur Trade Association, which now issues a list of incorrect and approved descriptions of furs that has been agreed by the British Fur Trade Alliance and the Drapers' Chamber of Trade of the United Kingdom. This list is published in alphabetical order, and thus, at the beginning, there appears the name of the "Cat, Sheared and Dyed," which is a trade term. By "sheared" is meant that the top hair has usually been removed, leaving the soft under-fur, which is then shorn, so that it is given a smooth, level appearance. The incorrect descriptions of the subsequent product are given as "Seal, etc.," sealskin being, of course, regarded as one of the costly furs. The official trade bodies name as the approved description of the treated article "Seal-dyed Cat," a term which clearly is not as attractive as the simple word "Seal," but it has the merit of being accurate.

NORWICH PUBLIC LIBRARIES

A little lower in the list is the trade term "Dog, Dyed Skunk or other Colour." The dogs whose furs are used are bred largely in Manchuria. Incorrect descriptions of this fur are given as being "Skunk, Fox, Wolf." The approved description is "Skunk (or other colour) Dyed Dog."

VARIOUS GUISES OF RABBIT FUR

No fur can quite rival in versatility that of the humble rabbit, or coney. As a matter of fact, the wholesale dealers in the various descriptions of furs described in the preceding chapter do not concern themselves at all with the rabbit. Yet rabbit skins have an important place in commerce and are sold at regular rabbit skin sales held every two months at the London Commercial Sale Rooms in Mincing Lane, London. The average number of bales of rabbit skins sold at four recent London auctions, when the offerings were of very moderate size, was just over 1,500. A bale usually contains 3,000 to 4,000 skins. Taking the average at 3,500 the average number of skins sold at each auction would, therefore, have been 5,250,000, so that the total sales at the two-monthly auctions throughout the year would be of more than 31,000,000 skins.

The fur of the rabbit represents the foundation of many hard felt hats, that of the hare being used largely for soft hats. Most of the rabbit skins, of which Australia and New Zealand are the chief source of supply, are of a light fawn colour, those of silver-grey, black, or deep fawn shades being specially packed. The

Name of Fur	*Some Incorrect Descriptions.*	*Some Approved Descriptions*
Rabbit or coney, dyed, pulled, beaver colour.	Electric beaver.	Beaver-dyed coney.
Rabbit or coney, dyed, pulled, or sheared, chinchilla colour.	Chinchilla, chinchillette, etc.	Chinchilla-dyed coney.
Rabbit or coney, dyed, pulled, or sheared, mole colour.	Electric mole, moline, etc.	Mole-dyed coney.
Rabbit or coney, dyed, sheared, beaver colour.	Electric nutria, electric beaver, beaverette, castorette, etc.	Nutria-dyed coney, beaver-dyed coney.
Rabbit or coney, dyed, machined, and/or sheared, seal colour or black.	Seal, electric seal, Red River seal, Hudson seal, seal musquash, Roman seal, near seal, sealette, etc.	Seal-dyed coney.
Rabbit or coney, dyed, in hair, black.	Black fox, black hare.	Black-dyed rabbit or coney.
Rabbit or coney, dyed, in hair, blue.	Blue fox, bleurette, etc.	Blue-dyed rabbit or coney, kitt fox-dyed rabbit or coney.
Rabbit or coney, dyed in hair, fitch colour.	Fitch.	Fitch-dyed rabbit or coney.
Rabbit or coney, dyed, in hair, kolinsky colour.	Kolinsky.	Kolinsky-dyed rabbit or coney.
Rabbit or coney, dyed, in hair, marten or sable colour.	Marten, sable, French sable.	Marten-dyed rabbit or coney. Sable-dyed rabbit or coney.
Rabbit or coney, dyed, in hair, mink colour.	Mink, visonette, etc.	Mink-dyed rabbit or coney.
Rabbit or coney, dyed, in hair, squirrel colour.	Squirrel, squirrelette, squirreline.	Squirrel-dyed rabbit or coney.
Rabbit or coney, natural, white.	Ermine, erminette, etc.	White rabbit or coney, imitation ermine.

rabbit is alternatively known as the coney, and various ways in which the fur is used as such is shown in the list extracted from the statement issued by the London Fur Trade Association given on page 223.

White rabbit and hare skins lend themselves quite well to the manufacture of imitation ermine, the dyeing of the "tails" being a simple matter. The ermine, like the rabbit, is a small animal, and probably 300 or 400 ermine skins would be needed to make a large ermine cloak. Similarly, a moleskin cloak would consist of hundreds of skins.

Sometimes in their dressed state the furs of animals appear as those of complete animals very different from those to which they belonged in actual life. As an example, there may be cited "Uncurled or Combed White Thibet Lamb." Originally the hair of the Thibet lamb is long, silky, and curled. When ironed and uncurled, it has been described as "White Fox, Iceland, etc., Fox." The officially approved descriptions of such a product are "White Thibet Lamb," or "Combed or Uncurled Thibet Lamb." Given what is known as a "dolly-head," the treated fur of the lamb takes on the appearance of a complete fox-skin. In the case of the genuine furs real heads of the animals are used, but there is a considerable trade in dolly-heads.

MISCELLANEOUS INDUSTRIES

LXI.—DEALS, BOARDS, AND BATTENS

Definitions are given in the British Merchant Shipping Act of "heavy" and "light" wood goods. The Act specifies those woods, such as pitch-pine, mahogany, oak, and teak, which fall within the description of heavy woods, and then defines the expression "light wood goods" as meaning deals, battens, or other light wood goods of any description.

"Light woods" or "soft woods," as they are usually termed in the trade, are imported on a large scale into this country from Scandinavia, Finland, and (especially in the past) from Russia, and also to some extent from Canada and the United States. They are used for constructional purposes and joinery, and for the manufacture of light articles of furniture and packing cases, and indeed for innumerable purposes. The wood is sawn at the mills in the countries of origin into pieces of various sizes found suitable for the particular uses to which it is to be put, and it is with the terms given to these various pieces that dealers in light woods are largely concerned.

These terms are set out in a revised form of charter, known as the "Scanfin Charter," which was lately agreed between the Timber Trade Federation of the United Kingdom and the Documentary Committee of the Chamber of Shipping, and was approved by the

Documentary Council of the Baltic and White Sea Conference for the transport of wood from Scandinavia and Finland to the United Kingdom. This form of charter provides for the carriage of the following descriptions: —Deals and battens, boards, scantlings, slatings, laths, staves, planed boards and floorings, ends and firewood. Sleepers for railway tracks are also imported largely into this country.

Red or Yellow Deal

All the usual sizes may consist of different kinds of wood. From Scandinavia, Finland, and Russia they may consist of red (or yellow) deal and whitewood. "Red deal" imported into London is known as "yellow deal"; in other ports of the United Kingdom the term used to designate this particular kind of wood is "red deal." That is a curiosity of the trade. London is the chief port in the United Kingdom for wood, and the trade there is centred in the Surrey Commercial Docks, but large quantities of light woods are also shipped to the Humber ports and to other ports on the North-East Coast, to the Bristol Channel ports, and to ports on the south and north-west coasts. From Canada are imported spruce deal and yellow pine deal.

Descriptions of Sizes

Although there is a particular type of wood known as "deal," the term "deals" is always used in the timber trade to signify a unit of size. It is one of the commonest of the terms of this type.

In the Scandinavian, Finnish, and Russian trades deals may be defined as pieces of wood 9 in. and upwards wide and 2 in. and upwards thick. The lengths of deals vary from 5 ft. to 30 ft.

"Battens" are pieces 8 in. and less wide and 4 in. and under thick, and are of similar lengths to deals.

"Boards" vary in size from 1½ in. and under in thickness and from 4 in. and upwards in width. Unless they are described as "planed" they are in the rough state.

"Scantlings" measure about 2 in. in thickness and from about 3 in. to 4 in. in width.

"Slatings" measure from 1 in. thick and 2 in. wide to ¾ in. thick and 1 in. wide, and from 5 ft. upwards in length.

"Laths" usually measure ¼ in. thick by 1 in. wide, or $\frac{3}{16}$ in. thick by 1 in. wide. The lengths range from 1½ ft. to 4½ ft.

"Staves" consist of short pieces about 42 in. long and of various narrow widths and thicknesses.

Imported "planed boards" are those, as the name implies, which have been planed in the country of origin ready for use. They may be used for such purposes as walls or floorings.

"Ends" represent short ends and other odd pieces which have been produced at the saw-mills in the course of cutting the pieces of regular size.

"Firewood" also consists of odd pieces. It may again be cut up in this country for the manufacture of packing-cases and into little pieces sold in bundles as firewood for domestic fire-lighting purposes. Much home-grown timber is also used for the latter purpose.

"Logs" may be defined as squares, sometimes merely hewn and sometimes sawn.

SALES BY THE STANDARD

All these sizes of wood are sold by what is known as the "St. Petersburg Standard Hundred," consisting of 165 cubic feet. The name "Petrograd" is not used. The terms "loads" and "squares" are also used as units of measurement. A load of sawn timber contains 50 cubic feet. A "square," applied usually to boards, consists of 100 superficial feet.

There is also a large trade in light wood from the Baltic as pit-props for the coal-mines in this country. Wood for this trade is sold "in the round," and is known as pitwood. It is a distinct trade in itself, the lengths and diameters varying according to the character of the seams for which the props are needed.

It is an interesting fact, in connection with the wood trade, that no two pieces of wood from different trees are alike. They vary in the nature of the grain and the number of knots (if any), and so individual judgment, reinforced, if necessary, by arbitration, has to be exercised in deciding whether or not timber delivered is of the quality for which the contract was made. Public sales of wood are held in London at intervals of about a fortnight.

LXII.—WOOD PULP AND NEWSPRINT PAPER

Paper may at first seem to be far removed from "Artificial Silk"; yet paper made from wood pulp and much artificial silk have a common basic material in wood. The manufacture of paper of various descriptions undoubtedly represents one of the most important industries of this country. The machinery employed in it is complex and the amount of capital invested in the industry is vast. The processes required for the manufacture of artificial silk are also complicated and, as was shown in Chapter XLIX., the industry, a comparatively new one, is steadily developing.

The main foundation of newsprint paper is to be found in the forests of the world. The British Dominions, and notably British North America, contribute a full share of spruce, while there is also a large export from the Scandinavian countries. The first stage in the manufacture of paper from wood is to reduce the basic material to pulp. There are two main descriptions of wood pulp known as "Mechanical Pulp" and "Sulphite Pulp" respectively. The methods by which these types of pulp are produced are clearly described in a very interesting pamphlet prepared by the Imperial Paper Mills, Limited, in connection with the British Empire Exhibition, to which the writer is indebted for some of his information.

When mechanical pulp is to be produced, all the branches are removed from the trunks of the trees, the stems are cut into convenient lengths, and the bark is stripped off. The white wood is then crushed between stone rollers in a stream of water until a pulp of fine short fibres is yielded. For convenience of transport this pulp is then partly dried and rolled into thick sheets somewhat resembling very coarse millboard. Mechanical pulp thus produced is short-fibred, is brittle, and tears easily.

In the manufacture of sulphite pulp chemical action is employed by which all parts of the raw wood are dissolved, except the fibrous portions, which are termed cellulose. The product is tougher than mechanical pulp.

Both types of pulp are exported from the producing countries to the paper-mills in thick sheets folded and secured in bales, each of which weighs about 4 cwt. In the subsequent processes of manufacturing most grades of paper both types of pulp are used in suitable blends.

Reduction to Wet Pulp

After arrival at the paper-mills the sheets of wood pulp are again reduced to wet pulp by being fed into "potchers," fitted with heavy revolving rolls, which separate the fibres and mix them intimately with water. At this stage certain other ingredients of paper are added. Thus there may be blue dye to increase the whiteness; rosin size to render ink less liable to run; alum to fasten the dye; and, when a fine smooth surface is desired, starch is added and also China clay, carefully strained. Cornwall, in which there are large deposits of this substance, thus contributes, notably to the manufacture of paper.

When the pulp emerges from the potchers in a condition which much resembles thick oatmeal porridge, it undergoes a number of refining processes, the chief object of which is to unify the fibres and remove any impurities of foreign matter. The mixture is then run off into storage tanks in which it is kept in continual motion. Quantities of this mixture are then drawn off from the storage tank, diluted again with a large percentage of water, and once more carefully strained. This fine fluid, which contains about 99½ per cent. of water and looks much like thin milk or very soapy water, is next allowed to flow over a moving wire or gauze. The network of this gauze is very fine, with about 3,000 holes to each square inch, and it moves forward in the form of an endless band with a rocking motion, the effect of which is to cause the fibres of wood held in suspension in the milky fluid to fall across each other in various directions. By this interlacing, or "felting," one of the final stages of the manufacture of paper is begun. While the felting is proceeding, the water is falling through the wire mesh, leaving the wet and interlaced fibres above. Water is extracted from this mixture of fibres by pumps connected to a series of vacuum boxes, and it then passes between two sets of rollers which squeeze it drier. At this stage the wet paper contains about 85 per cent. of water.

Drying of the Sheets

The mixture is then just strong enough to hang together for the instant while it is pricked off the wire at the last roll and transferred to soft woollen endless felts on which it is carried forward through further sets of rollers which squeeze more water from it and press the interlaced fibres into a more and more compact sheet. At this point the paper contains about 65 per cent. of water. This sheet is now passed round a series of drying cylinders heated within by steam, and the manufacture of the paper is completed by a final passage through pairs of heavy smoothing rolls which impart the necessary fineness of surface. From the time of straining the pulp until the finished dry paper is produced, only about three-quarters of a minute elapses. As the finished paper comes off the machine it is wound into large rolls. The width of these rolls is usually too large for commercial purposes, and they are therefore rewound, carefully examined, and cut in one or more places, leaving smaller rolls of the widths required.

Complicated though the processes are, the manufacture of newsprint paper at the mills is often, owing to the extreme efficiency of the methods, very rapid.

LXIII.—TYPES OF HAND AND MACHINE MADE PAPER

While newsprint paper from wood pulp represents by far the largest production of paper, there are, of course, various other descriptions of paper, the manufacturing processes of which follow similar lines to that of newsprint. The different kinds of paper may be divided, broadly, into newsprint paper, printing and writing paper produced from wood pulp, printing and writing paper manufactured from rags and esparto grass, wrapping paper, and boards.

In spite of the wonderful developments in machinery, hand-made paper may still be described as the aristocrat of the industry. It is claimed, on behalf of the hand-made paper industry, that no machine can produce quite the same dove-tailing or "felting" of the fibres which is secured by the "shake" of the vatman's arm, when making the hand-made sheet. Certainly the very finest types of paper are hand-made. The foundation of the greater part of the hand-made paper industry consists of cotton and linen rags, which are shredded and reduced, by the addition of water, to wet pulp, from which condition the sheets of paper are gradually formed and dried. All the hand-made paper-mills in England are to be found in the heart of the country, where some of them have been situated for centuries.

Much drawing paper and much of the best paper used for documents and ledgers are hand-made.

One of the highest types of hand-made paper is that used for bank-notes. For such paper, which is made by very few firms in this country, strong, clean linen material is used, such as the sails of yachts.

Tub-Sized Paper

Some descriptions of high-class paper are "tub-sized." In the ordinary way paper is sized by mixing size with the pulp in the "beater." To obtain the highest finish the paper as it comes off the machinery is dipped into a tub of animal size and then "loft-dried." Such paper is known as "tub-sized loft-dried."

For the purpose of art reproductions it is necessary to put a further finish on the paper. To secure this finish the paper is either passed through additional calender rolls, in which case it is known as "imitation art" paper, or a "coating" is placed upon it. In the latter case the resulting product is known as "coated art paper."

Most hand-made and high-class machine-made papers contain a "watermark." This is obtained by passing the sheet, while still wet, under a wire roll, which has the letters or design which it is desired to produce embossed upon it. A watermark is often given to machine-made papers, although, owing to the cost, only to the better descriptions.

BLOTTING AND WRAPPING PAPER

Blotting-paper is, as a general rule, manufactured by machinery. The essential distinction between blotting-paper and other kinds of paper is that it is un-sized. The addition of size prevents ink from running.

There are various descriptions of wrapping-paper. The highest types are manufactured from Manila hemp and jute bags, or from the ends of ropes. What is known as "Kraft" wrapping-paper has its foundation in wood pulp obtained by chemical action. Kraft wrapping-papers have a fine smooth surface.

Some of the cheaper wrapping-papers are made from waste-paper dyed. Any shade of colour may be imparted to paper by dye.

PAPER FROM ESPARTO GRASS

In Scotland an important machine-made paper industry exists based on the production of paper from esparto grass imported from North Africa. The industry concentrates on writing and printing-paper, and especially "feather-weight" paper for book-publishing.

Various classes of thin paper are manufactured, including the India paper especially made for the Oxford University Press, the composition of which is a secret. Descriptions of tissue-paper of various grades are made with great success by several British firms.

Before the Great War ordinary cigarette papers consumed in Great Britain were almost entirely imported. When, owing to the war, supplies stopped, British manufacturers stepped into the breach, and the British industry now rests on a solid foundation.

Uses of Boards

The term "boards" covers a multitude of grades. These may range from boards used in the building of houses, through those employed in the decoration and construction of railway carriages, to the thin pasteboards used for card indices. Boards are largely employed for book-binding purposes.

Boards may be divided into those consisting of one thick sheet of paper as it comes from the machine and "pasteboards," composed of three, four, or five sheets pasted together. The containers of cigarettes, known as packets, are made of paper-boards, and, likewise, many chocolate-boxes, cartons, etc.

Papier Mâché is the name given to a substance, the foundation of which is paper pulp pressed and moulded into various forms other than uniform sheets. It is used in the manufacture of various articles, and is quite durable.

LXIV.—HEAVY CHEMICALS

OUTSIDE of Mincing Lane and between that narrow, busy thoroughfare and the Baltic Exchange, in St. Mary Axe, lie offices which represent the important London market in heavy chemicals. It is a suitable site because, at its two extremes, the chemical market verges on commodities dealt in on the Baltic Exchange and on those bought and sold at the Commercial Sales Rooms in Mincing Lane. Until comparatively recent times merchants dealing in chemicals were accustomed to meet daily on the Royal Exchange. Partners of firms left their desks regularly in the afternoon to go on 'Change. Then the importance of this market dwindled very seriously, and the bulk of the chemical business is now conducted by private transaction.

The trade in heavy chemicals represents an important sphere of activity among the many interests of London business men. A cursory glance at the Board of Trade Returns shows that the trade in heavy chemicals represents a turnover of millions of pounds sterling every month. In addition, enormous quantities of chemicals are manufactured for home consumption, and the greater part of this trade is conducted in the London market.

THE TEST OF TRANSACTIONS

The phrases " Heavy Chemicals " and " Fine Chemicals " are essentially trade terms. The distinction between the two terms is often none too clear, and there is, indeed, some overlapping, for, as will be illustrated, a chemical may, at different stages of its marketing, fall within each class. Broadly, heavy chemicals may be described as those in which dealings usually take place on the basis of tons, for which pounds sterling are, as a rule, quoted, and as being the first products of manufacturing on a large scale. Heavy chemicals are used industrially in vast quantities, and transactions involving many hundreds of tons are of common occurrence.

Fine chemicals may be described as those in which dealings usually take place in pound weights, for which pence or shillings are quoted, and as being the products resulting from the purification, or other treatment, of heavy chemicals. Sometimes the degree of purity may be the determining factor as to whether a chemical should be classed as " fine " or " heavy."

COAL PRODUCTS AND FERTILIZERS

By-products from chemical operations on a large scale usually fall within the class of heavy chemicals, and, consequently, many of the products of gasworks figure largely in the trade in these commodities. Coal is, of course, one of the most important of all the sources of supply of heavy chemicals. It is responsible for many essential products, including ammonium salts, and it represents the foundation of the dye industry. A great variety of artificial manures and fertilizers, of which the chief constituents are potash salts, come within the description of heavy chemicals. Such products include kainit, sulphate of potash, and muriate of potash.

Sulphuric acid and hydrochloric acid, placed in the group of heavy chemicals, are manufactured in immense volume, and, being corrosive liquids, their transportation presents many difficulties. Glass carboys and iron drums are generally used for the distribution of these acids. Railway tanks are also employed for the purpose, and likewise, where water transport is available, tank barges, subject to the qualification that for hydrochloric acid the iron containers are now rubber-lined.

Lime, salt, tar, sulphur, and glycerine are all fairly well known as heavy chemicals.

Uses of Heavy Chemicals

Notable uses of heavy chemicals include the treatment of raw textiles, the production of explosives, the manufacture of soap by the saponification of fats, the tanning of leather, and the manufacture of paper. Heavy chemicals are also employed in many other forms of industry.

One important use of these substances is in the treatment of sewage. It is estimated that each individual accounts, on the average, for 30 gallons of sewage daily, the estimate including water used for washing and cooking. The whole of the sewage has to be treated by chemical methods, and since the population of Greater London alone consists of more than 7,000,000 persons, it is obvious that the amount of heavy chemicals required for this one purpose is very considerable. Purchases of heavy chemicals by the London County Council for the treatment of sewage are very large.

Washing soda is distinctly a heavy chemical, and sodium chloride (common salt) also falls within this category.

Wholesale and Retail Dealings

Sodium sulphate, the by-product from the manufacture of hydrochloric acid, which is sold under the term of "salt cake," is essentially a heavy chemical; but when salt cake is purified by a process of recrystallization it becomes Glauber's salts, a familiar medicine, and it may then be described as a fine chemical.

Sodium bicarbonate may be termed a heavy chemical. In that capacity it is extensively used in the mineral water trade. On the other hand, it is sold in small quantities by retail chemists for medicinal and household purposes, and in such forms it may be regarded as a fine chemical. It is an important constituent of baking-powder. In this way various products may be said to be both heavy and fine chemicals, and some are on the border-line.

LXV.—CRUDE AND FINE DRUGS

Another well-known classification in the chemical industry, besides those of heavy and fine chemicals, is that of "Synthetic Chemicals." The production of various fine chemicals by synthetic processes is constantly increasing. Synthetic chemicals, indeed, play a highly important part in the industry, both in manufacturing and in medicine. A large number of synthetic chemicals, such as aspirin, saccharine, and phenacetin, are derived from coal, as well as various substances used in photography.

Other important divisions of the products in which dealings take place in the chemical market are those of "Crude Drugs" and "Fine Drugs," the relation between which is somewhat similar to that between heavy and fine chemicals.

Crude drugs, as the term implies, are, as a rule, drugs in their raw state, such as roots, bark, flowers, and leaves, and from these crude drugs extractions are made which lead to the production of many fine drugs, etc.

Common examples of crude drugs are cascara, aloes, eucalyptus, opium, belladonna, liquorice, and jalap. Such drugs are only a few of the large number which form what is practically a special branch of the chemical trade.

The Products of Many Lands

Some of the plants yielding crude drugs flourish in this country. Many of them are grown abroad, crude drugs being imported from practically all quarters of the world, with the East, North and South America, and Russia prominent in the supply. Such drugs are handled by general produce merchants in Mincing Lane, as well as by firms specializing in chemicals. Dealings in these commodities illustrate where, as indicated in the last chapter, the chemical market and the general produce market in Mincing Lane dove-tail into each other. The Commercial Sale Rooms in Mincing Lane are the recognized meeting-place of all the principal merchants dealing in drugs, the market in which is obviously important.

Fine drugs represent, as a rule, the products of the treatment of crude drugs which, in many cases, involves elaborate processes before the finished articles are ready for sale. The bulk of these are delivered to the wholesale manufacturing chemists, who, in turn, remanufacture them into preparations for supply to the wholesale distributors, who, again, supply them to the retail traders, who sell them to the public.

The Case of Opium

A good illustration of the transition of a commodity from a crude drug to a fine drug is the case of opium. This product is the resinous gum extracted from poppies which are grown, to a large extent, in Turkey and India. The crude opium is handled by firms of manufacturing chemists for the production of alkaloids such as morphine and codeine. Many other examples might be given of the passing of a drug from the crude to the fine stage.

LXVI.—DESCRIPTIONS OF ISINGLASS

There are a number of forms of isinglass in which transactions take place in the London Commercial Sales Rooms. The descriptions and grades may be numbered by dozens, and the range of prices is from about 6d. to 20s. per lb., the commodity being valued by the London brokers.

Isinglass, or "fish maws," as it is more often termed in ships' manifests, may be defined as the swimming bladder of the sturgeon and several other species of fish. The principal sources of supply are Saigon, Penang, Brazil (Para and Maranhao), the West Indies, East Indies, India, and Burmah. It is also brought from Maracaibo in Venezuela. At many ports there are important fisheries.

Pipe, Cake, and Leaf

Isinglass falls into three or four main groups. In all cases the commodity is sun-dried before shipment. If the sound, or bladder, is marketed unopened, it is known as "pipe" or "tongue." Smaller pieces, also unopened, are known as "cake" or "purse," presumably because they are usually of the size of small cakes, or are not unlike pocket purses in appearance. There are also "lumps," which usually consist of small thick pieces.

If the sound, or bladder, is opened and unfolded it is known as "leaf" or "honeycomb." For good, clear leaf high prices are paid. Thus for fine Saigon leaf prices ranging up to 18s. per lb. may be bid, as compared with 7s. or 8s. per lb. for pipe from Penang. Isinglass from Russia, which is folded, is known as "book."

The best type of isinglass is thick and strong, and is free from blood and fatty matter. Isinglass is sold at so much per lb. and is brought to this country in wooden cases, which may contain any number of pounds up to a total weight of 5 cwt. A "lot" may consist of several cases and so, if the quality is good, will represent a considerable value.

Refining Beer and Wine

Isinglass is largely used for refining beer, cider, and wine. It is also used in high-class confectionery and as an invalid's food, and has various other uses such as, in conjunction with Spanish liquorice and lamp-black, the manufacture of Indian ink and, together with benzoin and sarsenet, the production of what is known as "court-plaster." In China it is regarded as an article of food, and the supply in the London market of isinglass from the East is sometimes affected by the demand from that country.

LXVII.—CRÊPE AND SMOKED SHEET RUBBER

THE chief market for rubber in the world is in Mincing Lane, London, colloquially known as "The Lane," and in its immediate neighbourhood. The public auctions of rubber were abandoned early in the Great War, and they have not been resumed.

Dealing in rubber came easily enough to the business men of Mincing Lane, whose powers of close observation have, by continued handling and close inspection of commodities, been highly developed, and dealing in rubber is admittedly a much simpler matter than the valuing and blending of tea, which were described in Chapter XII. It is said that a man might well spend twenty-five years in the tea trade and still be acquiring knowledge, while he could learn practically all that there is to be known about plantation rubber in a comparatively short time. Admittedly the different growths of wild rubber present many more complications.

DIVISIONS OF PLANTATION RUBBER

Plantation rubber, the product mostly of plantations in Malaya, the Dutch East Indies, and Ceylon, now quite overshadows in importance, from the market point of view, wild Para rubber.

Broadly, plantation rubber is divided into crêpe and ribbed smoked sheet. The standard qualities of these two kinds are described as first crêpe and smoked sheet, F.A.Q. (fair average quality), and to these the quotations appearing in market reports mainly relate. The standard quality of crêpe is, in colour, pale yellow, while the lower grades are brown and sometimes almost black. The term "crêpe" is used because the commodity has the crinkly, or corrugated, appearance of widows' crêpe. This roughness is caused by the passing of the latex through rollers revolving at different speeds, which thus slightly tear the substance. The appearance of corrugation is more strongly marked in some qualities than in others. Thick "blanket" rubber comes chiefly from Ceylon, and may be defined as rubber made by rolling several sheets of crêpe into one piece.

Crêpe rubber is now produced in sheets of special size for use in the soles of boots and shoes, especially for golf and tennis. These sheets are usually in the shape of pieces 36 in. by 13 in., and about ¼ in. thick. Although this is the most usual thickness of the sheets of rubber for this purpose, the sheets are sometimes ⅛ in. or ⅜ in. thick.

Ribbed Surface of Smoked Sheets

Smoked sheet is rubber which, as the name implies, has been smoked at the plantations, the process having been originally adopted in order to produce similarity with the wild rubber as marketed. The standard quality of smoked rubber is bright brown and clear in appearance. It is usually ribbed or marked with small patterns. In the manufacture of smoked sheet the rollers run at the same speed, and so the corrugated surface is avoided. The sheet is usually thin, and thus its weight does not vary to the same extent as that of crêpe. Smoked sheet has a smoky scent, which closely resembles that of kippers.

One possible defect of smoked sheet against which dealers are always on their guard is that of mildew. This is due to moisture in the rubber at the time of export, leading, as the result of "sweating" during the voyage, to the production of mould. Any appearance of mould will disentitle the sheet from being classed as of "standard" quality.

SAMPLING AND SALE UNITS

Samples of rubber are displayed in the sale-rooms of the various rubber brokers. They are usually in the form of strips and are extracted from the different consignments of rubber as these arrive in cases in London or Liverpool. Each representative sample is sealed and sent to the broker's office in a bag bearing the wharf label, on which are set out the number of packages represented by the samples, the number of samples (in order to prevent the abstraction of a less attractive piece), the weight of the consignment, and the name of the ship. Buyers, who are dealers selling to consumers, such as makers of motor tyres, purchase for cash, payment being made, at latest, fourteen days from the Wednesday following the day of sale. Sometimes dealers will search several brokers' sale-rooms in order to collect sufficient quantities of particular qualities. "Spot" sales may be of any quantities, from a few hundredweights upwards. The usual unit in "forward" sales is five tons, but as small a sale as of one ton may take place.

"Far forward" sales, some of which extend into two or three years, are made only in respect of plantation rubber. Dealings take place in the street itself. Forward sales may be on the basis of C.I.F., London landed terms (or "delivered London"), F.O.B., or ex-Godown (Eastern warehouse). When rubber is sold on "London landed terms" a sample taken at the warehouse will be submitted to the Standard Qualities Committee of the Rubber Trade Association, which will award a certificate of quality good for three months, and, once such a certificate has been granted, there can be no question as to quality.

The two chief divisions of Para rubber are "soft cure" and "hard cure." By soft cure is meant rubber collected and cured in the district around the lower parts of the Amazon and in the islands at the mouth of the river. Hard cure rubber is produced in the districts surrounding the upper reaches of the Amazon and in Bolivia.

LXVIII.—GUM COPAL AND SIMILAR PRODUCTS

Among the many commodities dealt in at Mincing Lane, for which London is the principal market, an important place is taken by gum. Of types of gum there are many, and knowledge of the different sorts and their particular uses and discrimination between the numerous grades can only be attained by long study. The various types are usually sold at so much per cwt.

Many readers will be familiar with the appearance of the little lumps of gum which exude from cherry and certain other trees. The bulk of the gum dealt in commercially exudes, however, from the roots of trees, and must be dug from the soil.

By far the most important use of gum is in the manufacture, in association with linseed oil and turpentine, of varnish, and the consumption of gum for this purpose throughout the world is very great indeed. Varnish, for instance, is largely used for coating railway carriages and engines and motor-cars, and a substance which is to be exposed, as in such ways, to all kinds of weather, must be of a high type. It is also used for polishing furniture, shellac only being employed in the perfection of the finer examples of the cabinet-maker's art. Incidentally, unlike shellac, in which most of the famous or notorious financiers have at one time or another gambled, gum is not the subject of speculative dealings by persons outside the trade.

Gum from the East

On the basis of quantities, Copal gum is much the most important type of gum. It is produced largely in Macassar, in the Dutch East Indies, whence it is forwarded to Singapore for shipment to the markets of the world. There are several grades of this type of gum. The finest kinds are known as White Sambas and Pontianac, each of which comes from Borneo. White Sambas, as the name suggests, is white in appearance, and, with the dirt scraped off, is very attractive looking. Pontianac is brown in colour, and is a very hard gum, which largely accounts for the high prices paid for this type.

Much Copal gum is of a yellow appearance. Gum of this type is of excellent quality, only ranking after the two descriptions just named. Most kinds of Copal gum and of some of the other descriptions are classified into "bold," "medium," "small," "nubbles," and "chips." There is also a large market in the "dust." The "bold" represents the larger blocks of gum, for which, as a rule, the highest prices are paid. Naturally there is less waste with the larger lumps than with the smaller pieces, each of which is covered by a certain amount of coating. But whatever particular grade is chosen, manufacturers of varnish will wish the pieces to be graded to approximately the same size. Otherwise, in liquefying the gum, the smaller pieces might be burned away while the larger lumps were in process of being melted.

NORWICH PUBLIC LIBRARIES

OLD DEPOSITS OF KAURI GUM

Kauri gum is derived from the Kauri pine-tree in New Zealand, and has the distinction of being, it is believed, the first type of gum to have been used in commerce. The gum is collected from trees many hundreds of years old. It is a high-grade type of gum and commands good prices. The supply of the finer grades is comparatively small, but considerable quantities of the lower grades are used in the manufacture of linoleum.

Another type of Copal gum is now exported from the Congo. It is of a cheaper grade.

EXPENSIVE AND CHEAPER SORTS

Gum Animi is shipped from Zanzibar and Madagascar. It is a hard gum of a good type, for which high prices are paid.

Gum Damar, which is exported from Singapore and Batavia, is also another high-class type of gum, and is a fairly expensive one. It is white and pale yellow in appearance, and is marketed in small pieces. Gum Damar is soft, is soluble without heat, and yields a pale, transparent varnish.

Cheaper sorts are Herol gum and Black Borneo gum. Herol gum is of a reddish appearance, and is mostly found in New Guinea. Large quantities of Black gum, from Borneo, are dealt in, the descriptions being classified in a similar way to the types of Copal gum.

GUM ARABIC FOR CONFECTIONERY

Gum Arabic is produced in the Sudan and Southern Asia. Unlike some other descriptions of gum, it is soluble in water, and it is used in confectionery, especially in the manufacture of pastilles. It is also used for adhesive purposes, as for the backing of postage stamps and the flaps of envelopes.

Another description of Gum Arabic is Gum Senegal, which is of a good type and similar to that found in the Sudan.

Gum Tragacanth is of a different type from Arabic, but, like that and Gum Senegal, it is used for confectionery. It is employed, especially, for the dressing of calico and other fabrics.

Gum Benjamin, which is marketed in small pieces, is, in conjunction with Gum Myrrh, used as incense. A sweet odour is produced by the burning of the gum. High prices are paid for it.

The London market is not, commercially, much interested in the marketing of chewing gum, which is mainly an article of consumption in the United States.

LXIX.—GRADES OF SHELLAC

One of the most interesting of the many products brought from the East and dealt with in Mincing Lane is shellac. It is produced in India and is shipped from Calcutta. It represents the exudation of an insect deposited on the barks of trees. It is collected from the trees, is washed and refined, and is treated with resin. Shellac is largely used in the manufacture of the very finest descriptions of varnish, gum copal being used in the manufacture of the cheaper kinds.

London is the international market of the world for shellac, and, although all the supplies are not brought to this country, the bulk of the transactions take place in London. Shellac is usually sold on a C.I.F. basis. Thus transactions may take place on the basis of C.I.F. Scandinavia, or C.I.F. New York.

The market knows five main descriptions. There is the standard grade, known as "T.N. Orange," the initials being, it is believed, those of the original shippers of this description. It is of a yellowish-brown appearance.

Button and Garnet Descriptions

A rather better grade is known as "Second Orange," which is bright yellow in appearance, and a still finer quality is " Fine Orange." These three descriptions of shellac are marketed in the form of flakes.

Another description is known as " Button Lac," which is shipped from India in the form of buttons, having a diameter of about two inches. This is a description superior to " Ordinary T.N."

A cheaper sort of shellac is termed " Garnet Shellac," and described in the trade as " blocky." This is very nearly black in appearance, and usually reaches this country in lumps.

Prices of shellac are quoted on the basis of so much per cwt., and sales may take place in lots consisting of multiples of 25 packages, 100 cases weighing seven tons. Shellac is marketed in either bags or cases.

LXX.—IVORY TUSKS AND SCRIVELLOES

BUYERS from many countries come to the quarterly sales of ivory held in London.

A report issued by a leading firm of such a sale might, after a brief summary of the general course of prices, proceed, under the main heading of "Zanzibar, Bombay, Mozambique, East Africa, and Siam," to give representative prices per cwt. for "soft, large, and medium tusks," "billiard ball pieces," "billiard ball scrivelloes," and "soft bangle tusks." Prices for somewhat similar descriptions of ivory might then be given under the title of "Egyptian." References to "Maltese" ivory might follow, and then under the heading of "West Coast and Central African," prices might be included for hard and soft bangle tusks.

The ivory trade certainly has its fair share of special terms. At one time the tusks were generally known in the market as "teeth." This colloquial term still survives, but it is not now in such common use as in past years.

PRINCIPAL SOURCES OF SUPPLY

While ivory is generally known by the country or port from which it is shipped, a main distinction is between hard and soft descriptions. Maltese is a recognized term, although Malta is no home of elephants. The origin of the term is believed to be due to the fact that tusks from certain parts of Africa have been shipped to Malta and re-exported from the island. The term "Lisbon" ivory has a similar explanation. The description "soft" is, of course, only a relative term. All ivory is really hard. What is known as hard ivory has, as it is called in the trade, a transparent appearance. It is harder to cut than soft ivory, and so for some purposes is preferred. Broadly, hard ivory comes chiefly from the West Coast of Africa, and soft from the East Coast. The hard description is largely used for, among other manufactures, the handles of table-knives, the backs of hair-brushes, and other toilet articles.

Definition of Scrivelloe

Representative tusks, whether hard or soft, may weigh anything from about 16 lb. to 150 lb., or even more. The term "scrivelloe" (a word of Portuguese origin) means a small complete tusk weighing from about 3 lb. to 16 lb. Both tusks and scrivelloes, when sold in the market, contain a hollow portion which was imbedded in the skull of the animal, and a solid portion usually exceeding in length the hollow part. This hollow part is of no direct use to the makers of billiard balls, for which ivory is used. Complete tusks, or scrivelloes, are often bought by the manufacturers of billiard balls, who will then dispose of the hollow portion for other purposes. This hollow portion is, however, sometimes cut off the tusks, or scrivelloes, before shipment or sale, and the ivory is then sold separately as "billiard ball pieces," or as "cut hollows." The diameter of the solid pieces is set out in the sale catalogues.

Besides pieces there are also "cut points for balls," which are, as a rule, of larger diameter than the pieces. Further descriptions are "bagatelle pieces" and "bagatelle scrivelloes," since bagatelle balls are smaller than billiard balls, and tusks of smaller diameter can be used for their production. Most of the tusks are extracted from male elephants, but a certain number are taken from the female animal, whose tusks are, generally, straighter. They may, therefore, be more suitable for the purpose.

"Bangle tusks" are usually of fair size. There is a large demand for bangle tusks for the East, and a regular trade in "bangle pieces," consisting of those portions of the tusks which are suitable for the manufacture of bangles. A demand exists, indeed, for every portion of the tusk. The points and other small pieces may be used for carving into ornaments and knick-knacks. Considerable quantities of ivory are used in the manufacture of piano keys.

Old Stores of Ivory

The actual annual supply of tusks from freshly slaughtered animals is very small. The bulk of the supplies offered at auction are mostly drawn from the stores of natives, which may have been handed down from generation to generation as representing wealth. These stores are known sometimes to have been hidden in the ground. Ivory does not depreciate with time, and is also not liable to damage by water.

NARWHAL HORNS

At each auction there are usually offered small quantities of "mammoth" tusks, which have been extracted from the carcases of prehistoric animals found frozen in the "Far North." Although it is supposed that these animals have been dead for many thousands of years and the carcases quickly decompose on exposure to the air, the tusks are occasionally found to be in good condition. The substance is used as a substitute for elephant ivory.

There are also offered regularly at auction walrus tusks, rhinoceros horns, sea-horse tusks, and occasionally narwhal horns. The narwhal is the animal which, armed with one twisted horn, will pursue the whale, and with that weapon is capable of killing him. "Sea-horse" is a term used in the trade for the hippopotamus. It is not an accurate term, for the animal frequents rivers, and not the open sea. The various horns and tusks are used in the manufacture of stick and umbrella handles, and for other purposes for which very hard material is required. The substance of a tusk may be described as being something between that of bone and horn.

LXXI.—TORTOISESHELL SORTS AND MOTHER-O'-PEARL

Public auctions of tortoiseshell are held at the Commercial Sales Rooms in Mincing Lane, London, every two months. A representative report on a recent sale of one of the leading firms dealing in tortoiseshell stated that "all descriptions met with an excellent demand and sold at firm rates, and we anticipate that the good demand now prevailing is likely to be well maintained in the near future."

The Corporation of the City of London is associated, in its festive moments, with turtles, but the turtles used in the preparation of soup to sustain City magnates and their distinguished guests are distinct from the turtles which provide the valuable article of commerce known as tortoiseshell. The latter represents the covering of the hawks-bill turtle, one of the small sea turtles. The sources of supply of tortoiseshell are mainly the West Indies, Singapore, Brazil, Madagascar, Mauritius, Bombay and Zanzibar, and Ceylon. Most of it is brought to London and is sorted in the warehouses at St. Katharine's Dock. It is much used by women for ornamental purposes.

Tortoiseshell is found in the form of epidermic plates covering the bony carapace of the turtle. Of these plates there are thirteen. Five are in the centre of the back and are flanked by four plates on each side. These plates, each of which may weight several ounces and may measure several inches across, are separated from each other before shipment. They are known in the trade as "sorts." Thus in market reports quotations are given for "Sydney sorts," "Bombay and Zanzibar sorts," and "Singapore sorts." By the word sorts is always meant plates. The plates are classified into various descriptions. They may be divided into "stout and medium sorts" and "thin and medium sorts," and "selected sorts."

Tortoiseshell is sold at so much per pound in lots ranging up to 80 lb. or 90 lb. Yet a lot may consist of a very small quantity, such as 1 lb. of selected. Prices for ordinary sorts may range from 20s. to 40s. per lb., but as much as 400s. per lb. has been paid for the finest sorts. The finest tortoiseshell has a warm translucent appearance, with rich, red, mottled colouring.

Chickens, Hoofs, and Yellowbelly

The term "Chicken" represents a plate from a young, and not fully matured, turtle. Consequently, prices for chickens are usually much below those for ordinary sorts. In the course of grading, defective plates are separated from the sound sorts, and, of course, for these plates lower prices are bid. Surrounding the carapace are twenty-four marginal pieces called "hoofs," or "claws," forming a serrated edge. These are sold separately, and, as a rule, unless they are selected, they do not secure such good prices as the plates or sorts. Underneath the turtle and joined to the carapace by the hoofs is what is known as the yellowbelly. This generally ranks in quality above the plates, and so higher prices are paid for it. It is usually of a yellow appearance. Hence the name.

Classification of Mother-o'-Pearl

Mother-o'-pearl is also sold in London—usually two days before each auction of tortoiseshell. Of mother-o'-pearl there are many varieties and the trade in them is an important one, for the demand for the shells is great. They are largely used in the manufacture of buttons, and for the handles of knives, etc. There are the large white shells that come from Sydney, N.S.W., and from Broome, W.A. (which are amongst the best of all the shells), Manila, Mergui, and Macassar; the darker shells from Egypt, Bombay, and ports in the Persian Gulf, and what are known as the black-edged shells from Fiji, Tahiti, and Manahiki in the Pacific Ocean. Mother-o'-pearl may be described as the hard, iridescent internal layer of sundry shells, and especially of pearl oysters. The shells are graded in this country, although sometimes before shipment. Buyers, however, are inclined to favour grading in this country, the principles of which are well known. The shells are graded according to size, colour, and substance. As regards size, they are classified as bold, medium, and small shells. The smaller shells are known as "chickens," and the smallest of all are described as "oysters." There are also defective shells, which may have been attacked by worms.

Mother-o'-pearl shells are sold at so much per cwt. The shells are usually packed in cases containing one or two hundredweights, but they are sometimes shipped in bags. They are commonly spoken of in the market as "M.-o'-P. Shells."

Green Snail and Trocas

Another type of shell dealt in on the London market is known as green snail. Shells of this kind are also classified into bold, medium and small, and defectives. They come mainly from Australia, Burmah, Singapore, and Macassar, and they are sold at so much per cwt. They are also much used in the manufacture of buttons.

There are numerous other shells dealt in on the London market. Trocas are used in the manufacture of buttons in place of mother-o'-pearl. Other descriptions of the numerous varieties of shells dealt in commercially include murex, bullmouth, cone, and conch shells, and "spiders," "scorpions," and "silverlips." These are imported chiefly from the East Coast of Africa, and are bought in London chiefly for ornamental purposes.

LXXII.—OSTRICH FEATHER AUCTIONS

Public sales of ostrich feathers took place before the Great War at the Commercial Sales Rooms, Mincing Lane, London, once every two months, but the war produced a certain depression in the industry. The work of ostrich breeding is necessarily dependent for its success on the decrees and whims of fashion.

The use of ostrich feathers as ornaments dates back, as the discoveries in the tomb of King Tutankhamen have shown, to early days in the world's history. The account in *The Times* recorded how, when the sides of the shrine in the Valley of the Kings were removed from their positions, two fans of gold and ostrich feathers were discovered on the ground. It was added that when the Crown Princess Menem, of Abyssinia, visited the tomb of the King in 1923, she was accompanied by two servants, who fanned her throughout the visit with fans exactly like those discovered in the shrine. In the past the fashion in ostrich feathers for millinery and other decorative purposes has spread from the greatest ladies in the land, as has been portrayed in the Gainsborough pictures, through the middle classes, to the coster-girl, whose love of ostrich feathers is proverbial.

Paris, as the Mecca of milliners, has been a great buyer of ostrich feathers in the past, with Vienna also a large importer. The United States takes about half the world's supplies of feathers.

Feathers sold by the Pound

The catalogues of the firms offering ostrich feathers at auction are quite bulky documents. That of a world-famous firm showed a comparatively small supply of 429 cases, consisting of 394 cases of feathers from the Cape and 35 cases from Nigeria. The feathers are sold at so much a pound, and the cases contain from a few pounds to, perhaps, 150. The cases consist of feathers of more or less the same description which had been sorted and tied up in bundles in the country where the birds were bred. The finest feathers are grown on the male birds. Those from the female birds, which are usually grey in colour, are known as "feminas."

Prices bid for the cases vary widely, according to the quality of the feathers, the range being, perhaps, from as little as £5 to as much as £200 a case.

At most sales there are offered a quantity of Spadones or, as the term is printed in the catalogues, "Spads." These are feathers cut from the birds in the first year of their life. They are grey in colour and narrow, and comparatively poor in appearance. The best feathers are cut from the birds in the second or third years of their life. They are cut, not pulled out, which permits of the feathers growing again.

Grading by Colour

A main distinction is between colours, and after this broad distinction the feathers are again graded. Thus "Whites" will be subdivided into Prime, First, or Fine, Seconds, Thirds, and Inferior. Black feathers are described as Long Blacks, Medium Blacks, and Short Blacks. The term "Byock," which appears in most catalogues, indicates a black-and-white feather. Other descriptions are Long, Medium, and Short Drabs, Black and Drab Floss, and "Boos." The last-named term represents feathers from the tail of the bird. Boos are again divided into Whites, Feminas, Drabs, and Inferiors.

South Africa is the great source of supply. The ostriches are fed mainly on lucerne, the cultivation of which depends largely on an ample supply of water. Large sums have been spent in irrigating paddocks, where, under favourable conditions, the plant grows very quickly.

In the past sales of ostrich feathers have represented remarkably high values. Sales of from 4,000 to 5,000 lots in three or four days might represent a turnover of from £230,000 to £250,000, and the business of dealing in ostrich feathers is, financially, a quite important one.

Prohibited Imports

Ostrich feathers are now the only feathers of high value which are imported into Great Britain, as the import of those of egrets, birds of paradise, parrots, and other birds of brilliant plumage is prohibited by legislation, around which there has been much controversy. These are still sent to the Continent, and sales occasionally take place in Great Britain of feathers which were imported before the legislation came into force.

Poultry and Duck Feathers

Sales take place in the London market of poultry and duck feathers brought from various parts of the world, which are used for the stuffing of cushions, quilts, and feather-beds, etc. The prices paid are very different from those bid for the valuable feathers. They may range from about 9d. to 2s. a lb., but as the feathers are frequently sold in large quantities, the total sums involved are considerable.

LXXIII.—RED AND WHITE FRENCH WINES

THE chief differentiation in wines is between red and white descriptions. All red wine is made from black grapes, the skins of which are left in the vats with the juice while the process of fermentation is going on. White wine is made from either white or red grapes, but before fermentation begins the skins are removed.

STILL AND SPARKLING WINES

Another distinction is between still wines and sparkling wines. Still wines are bottled when the process of fermentation has been completed and the wine is in a quiescent state. Sparkling wine is bottled during the second fermentation, which always occurs in the spring following the autumn in which the grapes have been pressed. The wine is then in a state of great commotion, and it is this condition which is responsible for the effervescence of champagne.

Before champagne reaches the consumer it has for years received much careful attention. The cork, which is usually withdrawn with a "pop," is the second to have been forced into the neck of the bottle. After the first cork has been inserted the bottles are stowed in racks at a slight incline, so that, by daily shaking, the sediment is accumulated on the cork. After this course has been followed for some years the cork, carrying with it the sediment, is withdrawn, and a fresh cork is inserted.

ORIGIN OF CHAMPAGNE

France is a leading producer of the world's wines, and some of the terms given to the various kinds represent the names of the districts in which the grapes are grown. Much depends on the varying character of the soil. The term "Champagne" is applied to wine made from grapes grown in the arrondissements of Châlons, Reims, Epernay, and in certain communes of Vitry-le-François, all of which are in the department of Marne, and in a few communes of the department of Aisne.

Wine of champagne character produced in other districts of the Marne department may legally be described only as "Second Zone" champagne. This term is applied also to the wine of certain communes of the departments of Aube, Haute-Marne, and Seine-et-Marne. Other French wines, irrespective of origin, may not legally be sold as champagne, and the word champagne must not appear on the labels. They are simply *vins mousseux* and must be so described.

TERMS APPLIED TO CLARET

The term "Claret" is a corruption of the old French word "Clairet," which merely indicated a clear or bright wine. It is now generally understood to mean a light red wine produced in the neighbourhood of Bordeaux, but there is no objection to its being applied to wines of similar type, if properly qualified. Thus the term "Spanish Claret" is sometimes used to designate wine which, on other occasions, may be termed Spanish Rioja or Rioja Claret.

A great number of terms are used to signify particular descriptions of claret. Well-known names are St. Emilion, St. Julien, and St. Estèphe, the names implying that the wine has been made in the communes so named. A large number of the descriptions contain the name of a château. Wine so described would generally have been bottled at the château mentioned. The number of châteaux throughout France at which wine is produced is very great. The vintage year is also an important consideration.

White Bordeaux Wines

By "Graves" is now generally understood a special description of white wine grown in the district of that name south of Bordeaux, but in this neighbourhood there are produced a number of fine and ordinary red wines which may also be correctly described as Graves. Wine known as Graves may be described as a white claret. The term "Sauterne" is applied to wine made in the commune of that name near Bordeaux. It is similar in some features to Graves, but is, as a rule, sweeter. "Barsac" means a wine similar to Sauterne but grown in an adjoining commune.

Graves, Sauterne, and Barsac may all be included in the category of "white Bordeaux wines."

Beaujolais and Chablis

By the term "Burgundy" is meant a wine, either red or white, still or sparkling, from the department of the Côte-d'Or and from certain districts in the department of Saône-et-Loire. As in the case of claret, there are numerous qualities of burgundy, principal types being Beaune, Volnay, Chambertin, Romanée, and Pommard, the terms meaning that the wine was grown in the neighbourhood of the towns or vineyards named.

The term "Beaujolais" is given to a wine similar in character to burgundy produced in the departments of Saône-et-Loire and also, to some extent, in the department of Rhône.

Chablis is a white wine produced in the neighbourhood of a village of that name in the department of Yonne, to the north-west of Dijon. The term is, perhaps, more abused than any other, as wines are frequently sold as chablis which were not produced in that neighbourhood, and whose flavour is not in keeping with that of a true chablis.

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LXXIV.—PORT, SHERRY, AND OTHER WINES

There are many well-known descriptions of wine grown in countries other than France, whose productions were discussed in the last chapter. Thus hock, a contraction of the name of the German town of Hocheim, is now understood to represent wine grown on the banks of the Rhine or its tributaries, between Mannheim and Coblenz, or in the Bavarian Palatinate. Hock may be either white or red, still or sparkling. There are a large number of growths of hock, among the best known being Niersteiner, Hochheimer, Rudesheimer, Liebfraumilch, and Johannisberger.

"Moselle" signifies wine grown on the banks of the river of that name and its tributaries. By far the greater part of it is produced in Germany, but a very small quantity of Moselle is made in French territory.

An Anglo-Portuguese Treaty

Around the term "Port" there has in the past raged much discussion. By the term is now understood the fortified wine made from the grapes grown on the banks of the Upper Douro and shipped from Oporto. The word port represents a contraction of the latter name. The fortifying of wine means the addition of spirit, which checks fermentation and ensures the retention of sweetness in the wine.

By treaty between Great Britain and Portugal no other wine than that described, whether of Portuguese or other origin, may be sold as port, and the term may not be used in conjunction with other wording on labels. There is, however, no legal objection to describing such wine as of "Port character" or of "Port style." It is in accordance with the terms of this treaty that, occasionally, action has been taken by the Port Wine Shippers' Association which, in instances, has led to convictions. Wine somewhat similar in character to port is grown in Spain, and is known as "Tarragona."

In the case of exports of port wine to Great Britain a *visé* is given to certificates of origin by the British Consul in Oporto, and these certificates must be produced to the Customs in this country. The character of port wine is often indicated by its appearance. Thus port wine is sometimes described as "Ruby" or "Tawny." The term "white" is applied to port wine of a pale yellow colour.

The Origin of Sherry

Sherry is the best known of the wines produced in Spain. The name is a corruption of that of the town of Xerez, the centre of the wine-producing country of South-West Spain. The term is applied to wine ranging in colour from pale straw to deep brown, and including hundreds of grades varying in flavour. Colour is often used to designate descriptions. Thus there are golden and brown types. Most sherry is fortified. Sherry is considered more suitable for consumption before or after meals, or at the beginning of them, than throughout the courses. There are, however, light dry wines of the two types known as Montilla and Manzanilla which are entirely suitable for ordinary beverage purposes.

Madeira and Marsala

Madeira is the term applied to wine produced in the island of that name, and is, as a rule, of similar character to sherry.

Marsala represents a slightly fortified wine from Sicily. Its use in this country is traced to its introduction by officers in the Mediterranean Squadron during the Napoleonic wars, who were unable to get supplies of port wine.

Imperial Tokay

The term "Tokay" is familiar, but the wine is comparatively little known in this country. There are two varieties—one usually known as "Imperial Tokay," and the other as "Szamorodner." Both these wines are produced in Hungary. The finest Imperial Tokay is the produce of vineyards which were formerly the property of the Emperors. It is an extremely rare wine, is rich in character, and has an important medicinal value by reason of the phosphoric acid it contains. A small wineglassful of Tokay will often act as a powerful stimulant. Szamorodner represents a dry beverage wine of hock character.

Italian and Swiss Wines

Italy produces a number of well-known types of still and sparkling wines. Chief among the still wines are Chianti and Capri. Among Italian sparkling wines there is Asti, which is produced in the same way as champagne, but is, generally, sweeter.

There are numerous other types of wine, such as those produced in Algeria, Switzerland, and the British Oversea Dominions, notably Australia and South Africa. A feature claimed for Australian Burgundy is that it contains a proportion of iron.

Switzerland yields a moderate quantity of wine, both of red and white descriptions, of which by far the greater part is white. Swiss wine is largely consumed locally, but it is occasionally exported. There are three distinct types of still wine. One is produced in the Canton of Valais, extending between Aigle and Sion, the best known of which are the Clos de Montibeux and the Mont d'Or Johannisberg; the second type includes the wine of the Canton of Vaud, embracing practically the whole of the north bank of the Lake of Geneva; and the third consists of the wine grown on the banks of the Lake of Neuchâtel. A small amount of sparkling wine is also produced, which is sold as "Swiss Champagne," or by some other fancy name.

Wine is also made in Russia, Turkey, Rumania, Palestine, and Northern Africa (with the exception of Egypt), and also on the West Coast of South America. Such wines are, however, rarely found in the British market.

LXXV.—THE FOUR SPIRITS

Spirits, as they are sold to the public, consist, mainly, of alcohol in a more or less diluted form, and in their chief constituents there is, chemically, very little difference between brandy, whisky, gin, and rum.

Brandy may be described as spirit distilled solely from wine. Its manufacture thus involves a double process. By "Cognac" is meant brandy distilled from wine made from the juice of grapes grown in the neighbourhood of the town of Cognac, the centre of the communes of Charente and Charente Inférieure, in France. It is permissible to apply the term brandy to spirit distilled only from wine made from grapes, whether grown in other districts of France or, indeed, anywhere.

Malt and Grain Whisky

Whisky may be divided, broadly, into the descriptions distilled in a pot still and in a patent, or continuous, still respectively. Scotch whisky may also be subdivided into what are known as malt and grain whiskies. Malt whisky is made from malted barley in a pot still. Grain whisky is made in a patent still from a mixture of malted barley and unmalted grain. The distillation in the case of grain whisky is carried farther, and the product has less flavour than malt whisky.

The malting of barley is brought about by the placing of the grain in a steep, which is then filled with water. The barley is next cast and grown on the floor until the starch contained in it is converted into sugar. When the grain has, in this way, been malted it is kiln-dried with peat, which imparts to the whisky a smoky flavour. The mashing process then follows. This means that the malted barley is ground in a mill and placed in a mash tun, where it is gradually mixed with hot water until the temperature of the whole is 150 degrees F. It is then allowed to settle, and the worts or liquid which have extracted all the sugar are pumped into a tank and from there are run through a refrigerator for cooling purposes and into the fermenting vessels, where yeast is added.

The yeast feeds on the sugar and breaks up the worts into pure whisky, or alcohol, and water and carbonic acid gas. The fermented worts, or spirit and water, are then pumped into a pot still and there heated and evaporated. The product is then cooled and passed into a spirit still, where it is again heated, and the vapour, when condensed, is the new whisky of commerce. Water is added to bring it to the right strength. It must then be stored in casks for at least three years in a bonded warehouse before it can be used, the age and other particulars being duly recorded.

Storage in Casks

When whisky is made in a patent or continuous still the worts are converted into whisky in one process, and the spirit leaves the still at a strength of from about 62 to 64 over proof ready for use. It is then reduced by the addition of distilled water to 11 "over-proof" in the case of Scotch whisky and 25 over-proof in the case of Irish whiskey. The spirit is run into casks and placed in bonded warehouses for ageing in the same way as malt whisky.

By "proof" is meant a standard of strength, which is assumed to be 100. The strength of spirit may thus be proof or so much above or below proof. Lowland malt whisky is made in the Lowlands of Scotland, Campbeltown is produced at Campbeltown, Islay in the Islays, and Glenlivet in the Glenlivet district. Other descriptions are known generally as North Country Malts.

Art of the Blender

Most Scotch whisky consumed by the public consists of blends of malt and grain whisky and of various descriptions of each. As many as twenty or thirty may be blended together, although a blend may contain only a very few varieties. The art of the blender consists in securing a flavour approved by the public, while keeping the blend of an easily digestive character, or, in other words, of obtaining a fine flavour without the heaviness of pure malt whisky.

Features of Irish Whiskey

Irish whiskey (an "e" is always used in the name of the product produced in Ireland) consists of unblended spirit distilled several times in a pot still from a mash consisting of malted barley, unmalted barley, wheat, oats, and a little rye. It is claimed that the admixture of the unmalted indigenous cereals renders the spirit particularly wholesome and palatable, and imparts a ripe, full, and natural flavour to it. The malting of the barley is carried out in much the same way as in the Scotch malting process, while it is kiln-dried with the best anthracite coal from South Wales. The spirit in the principal proprietary brands of Irish pot-still whiskey is very mature, having, as a rule, been stored away in plain and sherry casks for at least seven years. It is seldom offered to the public at less than this age.

Pure whisky as distilled is white in appearance. A custom grew up, however, in the past of maturing whisky in casks which had previously contained sherry. As these casks imparted to the liquid varying shades of colour, all whisky now has colouring matter added to it, in order to give it practical uniformity of appearance.

Production of Gin

Gin may be described as the product of re-distillation of grain whisky with the addition of juniper berries. It may be either "dry" or "sweetened." Some distillers make gin as well as whisky, but in other cases grain spirit is sold to firms specializing in the manufacture of gin.

West Indian Rum

Rum, which represents a by-product of sugar by distillation from molasses, is produced in practically all countries where sugar-cane is grown, and principally in Demerara, Jamaica, and Trinidad, in the West Indies. Jamaica rum is quite different from all other types, and usually commands a higher price. Its distinctive and more pungent flavour is attributed largely to soil and climate. Rum, when distilled, is crystal-white in appearance, but it is usually coloured by the addition of burnt sugar. In appearance Jamaica rum is paler and more of the colour of sherry than the Demerara and Trinidad descriptions, which are very dark. Rum is mostly sold wholesale at 40 over-proof, Jamaica rum being sold per liquid gallon, and all other descriptions in London per proof gallon. In Liverpool all descriptions of rum are sold by the liquid gallon.

LXXVI.—MERCHANTS, FACTORS, AND BROKERS

The terms "factor," "broker," "commission agent," and "merchant" are used in a rather loose manner and without due regard to the exact distinction of meaning that should be conveyed in each case, and one or two of the terms are interchangeable.

A factor may be described as a man who buys goods in order to re-sell them at a profit. His calculations may, of course, go awry, and instead of realizing a profit he may, and often does, suffer a loss, especially in times of falling prices. He acts for himself or his firm alone, and solely on his own initiative and judgment. Sometimes he may have no warehouse of his own in which to store commodities he has bought. Factors or "dealers" participate in various trades, and especially in the corn trade. They are sometimes described as "merchants," the true functions of whom are described later. These two terms are occasionally used somewhat loosely and are regarded, in this way, as interchangeable.

Staplers in the Wool Trade

In the wool trade factors are in some cases known as "staplers." A true description of a stapler is a dealer in wool who buys comparatively small quantities from the growers, or through the brokers at the sales, and sells them to the top-makers, as received or sorted. Staplers frequently buy quantities of wool known as "star lots," consisting of any number of bales up to three, which they sort into larger lots and sell to the manufacturers.

A "broker" is a man who acts as an intermediary between buyer and seller, and is remunerated by a fixed brokerage. He may or may not disclose the name of his principal. If the name of the principal is not disclosed, the broker is understood to guarantee his solvency and the due execution of the contract. Brokers are commonly employed by merchants.

Duties of Commission Agents

A "commission agent" may be defined as a man who receives goods for sale or buys goods indented, in each case receiving a fixed commission for his work. He is usually appointed to act permanently for a firm, either in a selling or buying capacity, and so he is not in quite the same independent position as the broker, who may be acting at one moment for one firm and at another moment for a different interest. His position in general trading corresponds in some respects to that of a chartering agent in the freight markets, who undertakes all the chartering of freight space that may be required by a particular firm of shippers.

A "merchant" is a man who buys goods abroad or at home and re-sells them at home or exports them again, intending to make a profit on the transaction. As in the case of the factor he may, and often does, suffer a loss instead. In the export trade he sells on the basis of one of the various forms of contract which have been described in an earlier volume, such as C.I.F. or F.O.B. Very often he holds large stocks which he has bought, as he thought, on favourable terms and hopes to re-sell at a profit as opportunities offer. Similarly, he may have entered into contracts for the purchase of goods which he hopes to dispose of to other merchants or distributing firms. He fulfils a highly important function between producer and consumer, acting as a "buffer" between the two. He enables the producer to dispose of his stocks steadily, and he also permits the producer to enjoy the benefit of his capital and credit. He may buy supplies, although there may be no immediate demand for the goods by consumers, and he helps to discover markets and enables consumers to secure supplies immediately. He provides a steady outlet for the output of the producer or manufacturer.

Foreseeing and Meeting Demand

Many consumers abroad rightly regard Britain as a great storehouse of goods which they may draw upon at any moment, and it often happens that they leave their requirements until the last. It is part of the functions of merchants to foresee, by taking all kinds of factors into account, such as climatic conditions and seasonal changes, when an exceptional demand is likely to arise. The place of merchants in wholesale trade is similar to that of shops in retail trade, which must be ready to supply goods to a consumer whenever the need or whim of the moment urges him to buy.

From time to time proposals have been made for the elimination of the merchant in particular trades on the ground that his profit might be saved by bringing producers and consumers into direct touch. Such efforts have, as a rule, been unsuccessful, and the merchants generally to-day represent an important wheel in the machinery of commerce.

The term "shipper," it should really be unnecessary to emphasize, means anyone who ships goods. Yet the term is frequently used when "shipowner" or "shipping manager" is meant, and its abuse is often the subject of comment among business men.

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